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A JOURNAL  
OF MANUFACTURING  
INDUSTRY

*THE Inventive Age*

AND SCIENTIFIC PROGRESS.

EIGHTEENTH YEAR. }  
No. 1. }

WASHINGTON, D. C.---JANUARY, 1906.

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AGRICULTURE IN MADEIRA.

By H. H. BYRNE.



FUNCHAL, MADEIRA.

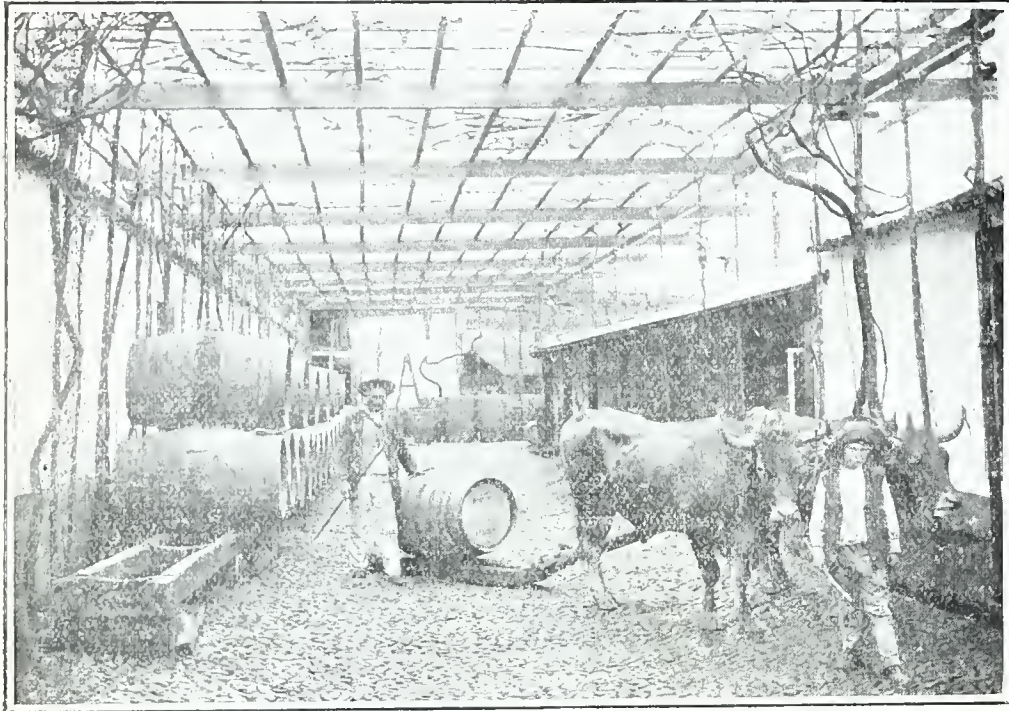
WE are all familiar with the celebrated Madeira wine, but little do we know of the people and their habits on the islands of the Madeira group which are so near to our own country. The islands lie about four hundred miles off the northwestern coast of Africa, and are a mere cluster of mountain tops projecting above the ocean; consequently the inhabitants have to adapt their ways of living in accordance with the nature of the climate and the geography of the land.

The inhabitants, who are mostly Portuguese, are not too abundantly provided for by nature, and consequently have to resort to every possible means for their sustenance. As every native has his farm spread over steep hill sides

and in ravines, it is with great difficulty that he can manage to till the soil at all; and as rains are scarce, he is doubly handicapped by the problem of irrigation. To solve this matter, the Madeiran farmer has arranged a series of tanks or reservoirs at intervals about his field, to which are led waterways that collect the streams as they run down the hill side. These reservoirs are watched and tended to with the greatest of care, as upon them rests the possible failure or success of the year's crop. In order that every inch of the land may be utilized to the best advantage, the Madeirians have terraced off the hill sides until they appear as a series of flights of stairs ranging from the beach to the mountain tops. The terracing accomplishes the double purpose



of facilitating the planting, and protects the earth from being washed away by heavy rains. The tilling of the soil is poor when compared to that of America, for the Madeirians do not know the use of our ordinary harrows and diggers; in fact, a Madeirian is considered quite wealthy if he possesses but one of our common plows. Their farming implements are of the crudest sort, and to this day they still use the branch of a tree for their plow.



A MADEIRIAN'S WINE HOUSE.

The soil is best adapted to the growing of grapes, and the greater part of the land is devoted to their culture. In reality the islands are one great vineyard. Standing out so prominently, the vineyards are exposed to the strong winds that occasionally blow, and which sometimes reach great velocity; but to avoid this possible injury, the vineyards are divided from each other by high stone walls that serve as wind-breaks. As the heat

Madeirians have mastered the science of grape culture, and today they are experimenting for the best results in order to compete with their rivals. The Madeirian allows his grapes to remain on the vine until they become half dry, when they are gathered into great arm baskets and brought to a central house or shed to be assorted. After the crop has been collected, it is packed into suitable carrying vessels and transported to the wine house.

Here it undergoes the usual process of pressing, to be converted into the liquid bearing the island's name.

After the wine has been extracted, it is stored in large vats for fermentation, and then carried in skin sacks on the backs of the Madeirians to the shipping houses. In their equipment, these houses will compare favorably with those in Germany or California. In picturesqueness particularly, they contribute much towards making



BRINGING WINE IN FROM THE COUNTRY.

during the day is unusually intense, the vineyard masters have the vines trimmed and the grapes picked during the night by moonlight. Thus in reality the Madeirian farmers, although so near us, have a life which compares to ours as ours does to the Chinese. As results have proven, the

Madeira the veritable garden that it is; for annexed to every shipping house there is an arbor so shaded and cool that it might well be termed the Madeirian's "wine cellar." Arranged about the "wine cellar" are shelves of frame work upon which barrels of wine are stored to remain for many

years. When it has reached the required age, the wine is labelled and packed for exportation to every part of the globe.

The wine merchants have a unique method for moving their barrels about. Wheeled vehicles are unknown to them, but to answer their purpose, a log provided with a runner serves as a sledge and is drawn by oxen, as shown in the illustration above. To facilitate its locomotion, the pavement is smeared with grease by the driver who walks ahead of his team.

#### Motors Within Wheels.

Very satisfactory results have been obtained with a large truck fitted with an electro-motor inside each wheel. A pinion at each end of the motor shaft engages direct with a big gear ring just inside the rim of the wheel. There are two of these gear rings set with the teeth facing each other, and the pinion at one end of the motor shaft engages with one ring while that at the other end meshes with its fellow. Thus the full power of the motor is applied direct to the rim of the wheel where it is required, and all the various losses consequent upon the use of gearing are obviated. It is said that there is a saving of 30% of power as a result of this method of transmission. Another advantage of situating independent motors in all the wheels is that steering may be accomplished by means of all the wheels at once, and the car can turn in a much shorter space. It is even possible to move the car sideways, by turning the axles of all the wheels in the same direction. The reports on the trials of a five-ton truck fitted with these motors are very satisfactory; and the excessive vibration which the motors might be expected to receive has not, up to the present, given trouble by causing the brushes to jump and spark.

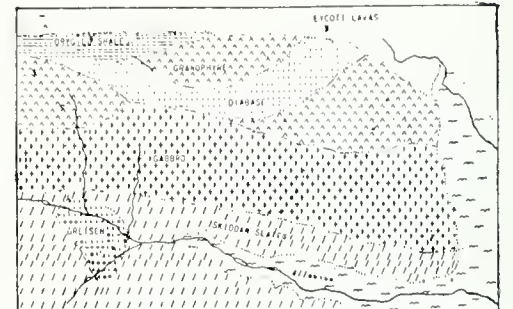
#### Cellulose From Corn-stalks.

The peculiar property of compressed cellulose, by which it almost instantaneously absorbs water in large quantities and swells to a corresponding extent, gives it a prominent place in the construction of the safety sheathing of warships. Behind the heavy armor of Harveyized steel is a packing six feet thick of compressed cellulose. Immediately this jacket is pierced by a shell, the water, reaching the cellulose, swells it up and closes the hole; and so speedy and certain is its action that all new warships are being constructed with this protective jacket. Cellulose has hitherto been prepared principally from coconut shells, but the supply of nuts has fallen far short of the demand, in view of the increased use of this material. It has now been found that cellulose suitable for this purpose can be manufactured from the pith of corn-stalks—thus adding another method of utilizing corn to the hundreds already known. Now the stalks, which were formerly thrown away, are being made to yield their pith not only to the protection of warships, but for the myriad useful purposes to which cellulose is being daily applied. In the process of manufacture the stalks are allowed to thoroughly dry for six or eight months, after which they are cut into short pieces and the pith shaken out. This is chemically treated to make it fireproof, and after compression to one-sixteenth of its original bulk, it is made into blocks six inches square, and is ready for shipment.

#### Map-Drawing With a Typewriter.

A most unique combination of art and machinery is that described by R. A. Daly in *Science*. Facility and cheapness rather than effect, which is not neglected, however, are the main reasons for the invention of a typewriter that prepares text illustrations, maps, sections, or diagrams while you wait. "The aim," says Mr. Daly, "has been to secure economy of time in execution and clear-cut precision of legend in drawing. In both these respects, enough success has been attained to warrant the recommendation of the machine method to geologists, geographers, and others who desire to prepare useful text illustrations at a minimum cost of labor."

Describing the machine Mr. Daly says that, following his specifications, there has been built, "a typewriter provided with a carbon ribbon and with ninety special characters designed for the preparation of line drawings to accompany geological and geographical papers. The same machine can be similarly used for statistical, engineering, and other diagrams of a more or less mechanical and simple composition. Of course, this method should not wholly replace the use of the pen even, for example, in the differentiation of areas in a geological map or section. The ultra



From Science  
GEOLOGICAL MAP WHOSE MARKINGS WERE MADE WITH A TYPEWRITER

mechanical look of the typewritten legend can often be pleasingly relieved by the easily and quickly applied cross-hatchings, etc., made with an ordinary drawing pen. In complex diagrams, free-hand work may generally be expected to supplement the work of the machine.

"The typewriter has its most general application in lettering, that most difficult element in line drawings. The particular machine has the advantage of making it possible to employ a great range of type styles. Using the carbon ribbon, the writer has found that any one of the one hundred and twenty-five shuttles made for the machine (each shuttle bearing ninety characters and including the lettering for one of twenty-six different languages,) will give an impression suitable for photographic reproduction. Each shuttle can be placed in the machine ready for work in a few minutes.

"The accompanying map is reduced to two-thirds of its original diameter. It was copied from Harker's sketch map of the Carrock Fell District, published in the *Quarterly Journal* of the Geological Society of London, Vol. 51, 1895, Pl. IV. Here the geological formations could have been yet more clearly differentiated by cross-hatching with the ruling pen for one of them, but this particular drawing was made to illustrate the neatness and clearness of the machine-made production rather than to illustrate an ideal diagram. So far as the typewritten part of the 'drawings' is concerned, the use of the machine in preparing these illustrations represents a saving of from seventy-five to ninety per cent of the time required by a draughtsman to duplicate the 'drawing.'"



## THE "BENNIS" AUTOMATIC STOKER.

FROM the time of James Watt until our own days, go-ahead engineers all over the civilized world have made ceaseless efforts to produce cheap steam with smokeless chimneys, and to secure the utmost economy in the utilization of energy.

If proof of this assertion were needed, it is furnished by the records of the Patent Office, where the number of patents having this desirable object in view, may be counted by thousands.

Poets, novelists, and practical men have, each and all, told their tale of a world in which perfect combustion is possible, and a very pretty story it is. Cleanliness, purity of atmosphere, health and happiness are the order of the day in this beautiful Utopia. Howbeit, that word Utopia it would seem, is not after all impossible, thanks to the inventive genius and persistent determination of the engineer, to whom we are indebted for so many wonderful accomplishments, both in peace and in war.

Whilst we admit that not even the most hopeful inventor can claim for his apparatus that it fulfils ideal conditions, yet there is no doubt that excellent results can be, and are being obtained, and these frequently under the most adverse conditions.

He would be an extraordinary man indeed who looked upon the average boiler as an ideal apparatus for the economical generation of steam. Let that boiler be fired with praiseworthy carefulness and incontestable skill, yet the performance of obtaining the highest calorific value from the fuel used is one which can only be carried out under laboratory conditions. But, to the sternly practical. First, let us consider what an ideal mechanical stoker should fulfil; and secondly, how far existing mechanical stokers of that type of mechanical stoker we are specially dealing with, are able to meet the requirements of the ideal.

First, to quote the words of an eminent M. I. E. E., the ideal stoker should:

- (1) Increase the economy in fuel when compared with hand-firing.
- (2) It should secure a smokeless furnace even with bituminous coal.
- (3) It should have few wearing parts.
- (4) It should possess reliability.
- (5) It should be self-contained.
- (6) It should incur small capital cost.
- (7) It should require small maintenance cost.
- (8) It should be worked at small running cost.
- (9) It should be provided with an adjustable feed.
- (10) It should be automatic in action."

Now all these main-line requirements of an ideal stoker are fully met

in the "Bennis" Patent Gold Medal Machine Stoker fitted with patent pneumatic gear and self-cleaning compressed air furnace, which is an efficient and simple machine for feeding coal into the boilers and other furnaces, and well adapted for heat producing purposes—furnace work, heating, puddling, forging, roasting, baking, drying, gas-producing; also used in dry kilns, digestors, evaporators. In fact wherever it is possible to use coal firing, the "Bennis" Machine Stoker is guaranteed to do the stoking cheaper and more evenly; producing a steady, uniform fire all day with less coal and without interruptions for the supply of "green" coal and consequent variation of temperature.

With the "Bennis" Stoker, fire-doors can be kept closed practically all the time. The man attends to the production, but the "Bennis" Stoker



does all the rest, introducing the coal automatically into the furnace in the exact places where it is most needed to secure perfect combustion, adjusting the supply of air to the fire to consume that fuel perfectly, continuously removing the clinker and ash, which it carries forward to the end of the bars dropping into a closed chamber whence it is withdrawn once or twice a day. It has the further advantage when fitted with a compressed air furnace, of regulating the steam blast and increasing or decreasing the quantity of steam as required. The "Bennis" system thus gives complete control over the supply of air, over the feed of coal, and over the rate of feed, so insuring complete combustion and as rapid combustion as may be desired.

Complete combustion and a perfect control of combustion were, until recently, ideals. Today, thanks to the continuous and persistent experiments

of Messrs Ed. Bennis & Co., they are realized attainments with results that may be seen and tested in hundreds of important power stations and boiler-houses throughout the world.

They claim, and careful investigation attests that they can in every case prove their claim, that the "Bennis" Machine will:

- (1) Burn low grade fuel (that cannot be dealt with by hand-firing) or high grade fuels, with the utmost economy.
- (2) Effect great economy in fuel.
- (3) Give more steam from the boilers than can be obtained by other means.
- (4) Prevent black smoke.
- (5) Give less work to the firemen.
- (6) Prolong the life of the boiler.
- (7) Respond to sudden calls for steam, burning capacity usually being up to 60 lbs. of fuel per square foot of grate surface per hour.

Among other advantages offered by the apparatus, we may mention that the cleaning out of fires is unnecessary; that each fire is under separate control; that the fire-doors open outwards, as in ordinary hand-firing,

The weight of the fuel pushed over is regulated by means of an adjustable cam on the driving shaft, so that the rate of feed can be seen by noting the position of the cam. The simple motion of turning a hand-wheel whilst the machine is running, enables the coal feed to be graduated from nothing to a ton per hour. The fuel thus pushed over falls on to a flat plate called the shovel box, from which it is projected into the fire at intervals by an angular shovel, being effectually scattered over different portions of the grate. The shovel is actuated by the patent pneumatic gear. This consists of a long coiled spring enclosed in a cylinder and pressing on a piston, the spring is merely to propel the shovel forward, any remaining force being taken up by an air cushion, thus avoiding all shock or jar on the boiler front, and making a practically noiseless machine.

The cam which draws back the shovel has four varying lifts, the effects of this motion being to scatter the fuel on the fire in four divisions, each about 18 inches long, so that in a 6 ft. furnace the fuel is thrown on only a quarter of the fire at once; a most material point where smokelessness is important, giving time for each portion of the fire to become incandescent between its charge.

When using low class or waste fuels, which generally contain a large proportion of clinker and ash, the air space in the fire bars of ordinary furnaces soon become, more or less, covered or stopped up, and the fire suffers in consequence.

It is manifestly impossible to adjust the supply of air to the fire to consume the fuel perfectly, unless the clinker and ash are continuously removed. In the "Bennis" patent self-cleaning compressed air furnace, this is effectually accomplished. This consists of tubular fire troughs of the length the grate is intended to be. The upper surface of each fire trough consists of small interlocking grate bars in about two feet lengths upon which the fire rests. The fire troughs all move into the fire together about two inches, and are then drawn out by means of four inch cams on a transverse shaft. These cams are

and are of large size, and that the air supply to the fire and the coal supply are under immediate and simple control.

For those of our readers who are interested in a more detailed technical description, we append the following instructive account of the construction and design of the "Bennis" Patent Gold Medal Machine Stoker fitted with pneumatic gear and self-cleaning compressed air furnace.

In this machine small fuel or slack is thrown by hand, or fed by mechanical means into a stoker hopper of about 3 cwt. capacity, of which there are only two to each Lancashire boiler. Under the hopper is a cast iron feeding box, in the interior of which there is a simple pusher plate with an adjustable reciprocating motion. The fuel falls in front of the pusher plate, and is pushed, by its movement, over a ledge formed by the bottom of the feeding box.

made the full width of the troughs, so that there is scarcely any wear upon them, and so powerful is the self-cleaning action, that in travelling from the front of the fire to the back, the coal ascends an incline of more than 3 inches. The clinker and ash is slowly carried forward by this action to the end of the bars, where it drops over into a closed chamber, gives up its heat to the boiler, and is drawn out about once or twice every day.

The air spaces between the bars being always free and open and each tubular fire trough having its own supply of air, fed by a minute steam jet, the draught is evenly distributed over the whole fire grate, and the boiler continues to do its work even while cleaning out the clinker from the chamber, while the fire being always clean is ready to have sudden calls for steam made upon it. By turning on the blowers full, the rate of combustion can be enormously increased.

The bars are constructed with extremely fine air spaces so that breeze or dust fuel may be burned with advantage.

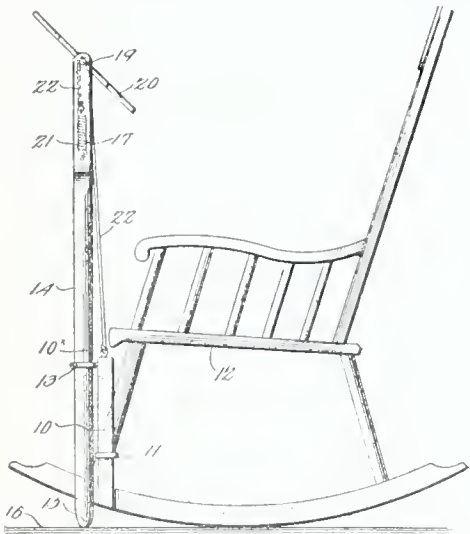


## CLEVER NEW PATENTS.

Fan.—Lifting Jack.—Twine Holder.—Fishing Bob or Float.—Metal Shearing Device.

### Fan.

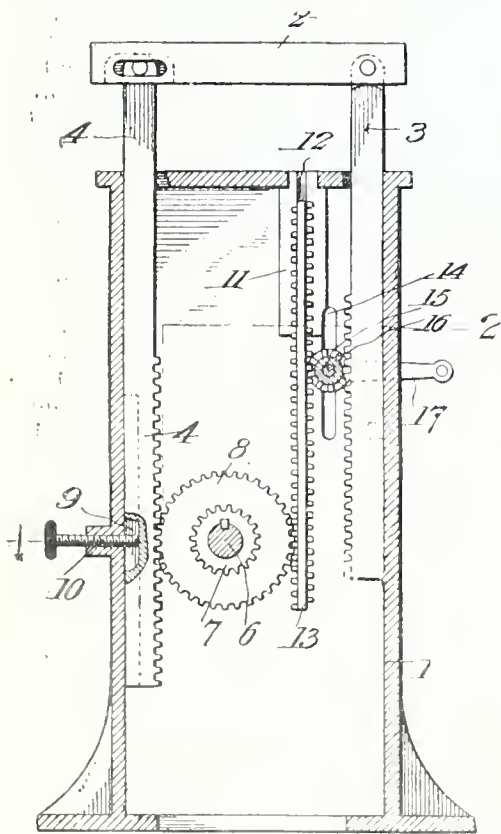
A novelty in the shape of a fan arranged to be attached to an ordinary rocking chair and operated on the movement of such chair, has been devised by Mr. B. F. Gilman, of Dennison, Texas. An arm 10 is employed that is arranged to be detachably connected to the chair, and has a lateral guide 11. A standard 14



passes through the guide and rests upon the floor, and a shaft 19 carrying a fan 20 is rotatably mounted on the upper end of the standard. A flexible cord 22, secured to the arm, passes about the shaft, and has a connection with a coiled spring 17 secured in the standard. By this arrangement, it will be clear that when the chair is rocked, the cord will be pulled, thereby rotating the shaft and operating the fan.

### Lifting Jack.

William A. Johnston, of Rural Retreat, Virginia, has patented a unique lifting jack, and has assigned a one-half interest therein to Mr. Wm. W. Buck, also of Rural Retreat. The

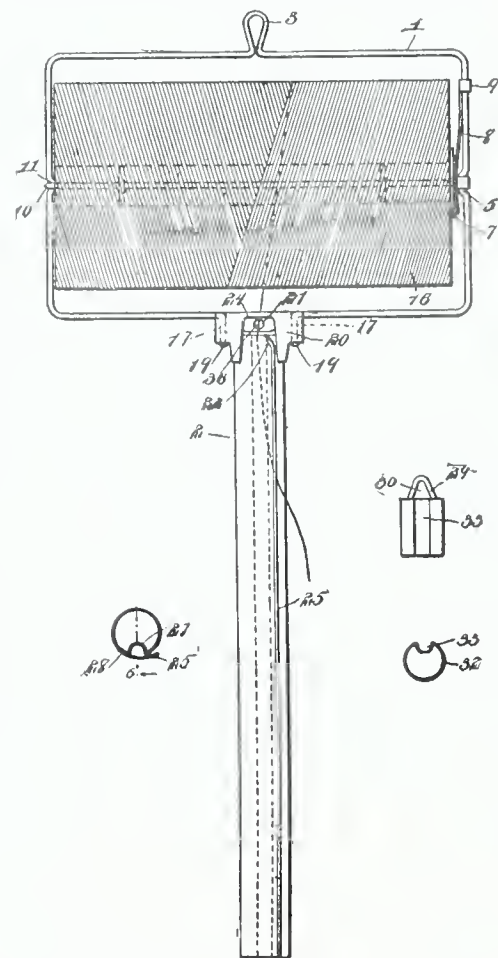


object in view is the provision of means in which the lifting force is applied to a load-carrying platform at a plurality of points, the jack being in a measure self-balancing, so that a heavy load applied at one point will

tend to elevate the platform at another point. As shown in the accompanying cut, a frame 1 is employed having a vertically disposed slot 14, through which an operating shaft 15 extends, the shaft having a suitable handle crank 17. A gear 16 is mounted on the shaft and meshes with a double rack bar 13, located in the frame. A load-receiving platform 2 is arranged above the frame, and has a rack-bar 3 pivoted thereto. This rack-bar extends downwardly into the platform in spaced relation to the rack-bar 13, and has the gear wheel 16 in mesh with it. A second rack bar 4 is also pivotally connected to the platform, and a shaft 6 mounted in the frame, carries a gear and pinion that are adjustable longitudinally thereof. The gear is in mesh with the double rack-bar 13, and the other rack-bar 4 is arranged to engage either the gear 8 or the pinion 7, a screw 10 being provided for adjusting the rack bar 4 to hold it in either position.

### Twine Holder.

A novel twine holder has been invented and patented by Mr. William Steger, of Marietta, Ohio. The invention relates more particularly to that type of twine holders in which a weight mounted for reciprocation in a suitable guide forms a slack take-up.



The object of the present invention is to improve twine-holders of the type specified by the provision of means for holding the twine so that it may be kept at the right tension, and providing a twine-guide in which the twine may be readily positioned, and the parts not easily deranged.

A further object of the present invention is to improve the means for supporting the twine in the twine-holder and to provide an improved form of weight guide.

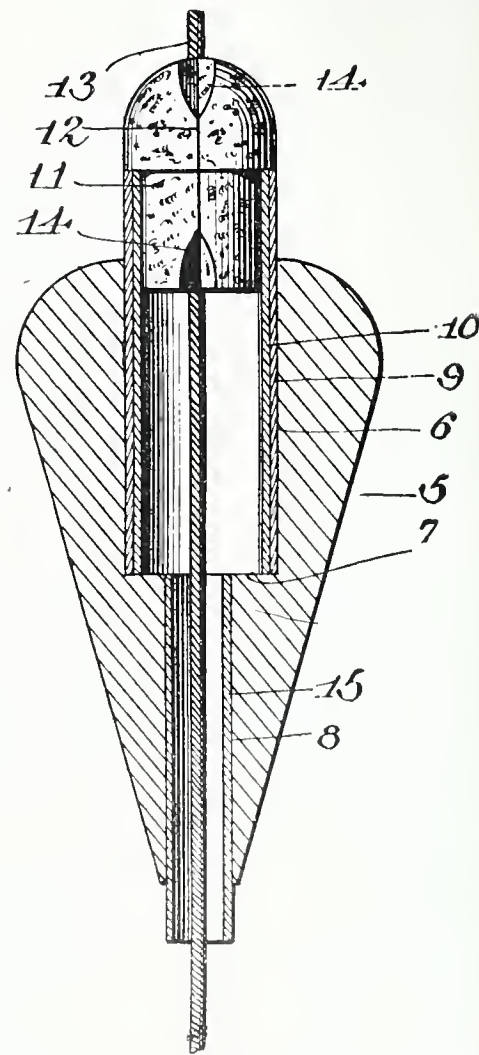
The holder 1 for the spool is formed of wire with a cross piece on which said spool is journaled. Suspended from the holder is a tube 2 of sheet metal in which a weight is slidably mounted, and alongside the tube is formed a twine guide 27 that projects into said tube and engages the groove 33 of the weight 32 to prevent turning of the same. The cord is threaded from the spool down through the eye 29 of the weight, then over the top of the tube and down the guide 27. Thus, when said cord is drawn outwardly, the weight is raised; and, as soon as the free end of the cord is released, the weight drops down the tube and will elevate the free end of the twine and keep it out of the way.

### Fishing Bob or Float.

To modern disciples of Izaak Walton, the unique fishing-bob or cork invented by Mr. Andrew J. McCord, of Chattanooga, Tenn., will prove of interest. The accompanying illustration is a sectional view through one form of the same. The float consists of a body of the ordinary shape having a central bore therethrough, and having a counter-bore in one end forming an intermediate shoulder 7. Lining sleeves 6 and 8 are located in the bore and counterbore, and a removable collar 10 is arranged within the sleeve 6. In one end of this collar is detachably fitted a line-clamping device, in the form of a split plug 11 of cork or other suitable material.

In applying the device to a line, the plug or clamping element 11 is removed from the sleeve or collar, and the line is inserted in the longitudinal kerf thereof, and is passed through the cylindrical bore of the bob, after which the plug is replaced in the sleeve or collar 10, and the latter is introduced into the socket. The bob may then be adjusted to any desired length of line by sliding the same longitudinally on the line, the adjustment being effected without chafing or otherwise injuring the line. The sleeve or collar 10 constitutes a holder for the plug or clamping member, which permits the latter to be readily removed and renewed when necessary, while the shoulder 7 forms a stop to

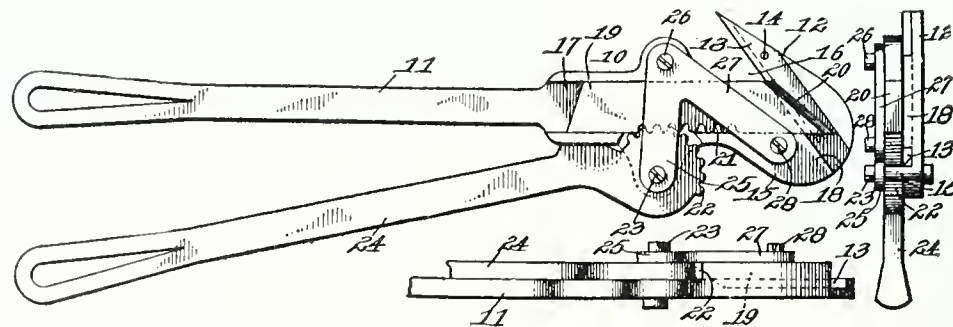
limit the inward movement of the holder. By having the plug formed of yieldable material, the float or bob



is effectively clamped on the line without the necessity of looping, knotting or otherwise tying such-line.

### Metal Shearing Device.

A novel metal-shearing device has been invented by Mr. Dudley E. Eddleman, of Weatherford, Texas, and a three-fourths interest in the patent secured thereon has been assigned to Messrs. Hays McFarland and Ezra A. Frantz, of the same place. The invention relates more particularly to implements for severing cotton-bale bands, but is clearly applicable to other purposes. In the particular form illustrated, a handle stock 11 is employed having at one end a rearwardly inclined V-shaped recess 16, provided with an inclined cutting blade 13, the stock also having spaced longitudinal guides, forming a guideway 17. A plate 19 is slidably mounted in the guideway, and has an inclined cutting edge 20 coacting with the blade 13. The plate also has a rack 21 in its rear side, and a lever arm 24 pivoted to the stop is provided with a gear segment 22 meshing with the rack. A brace 25 connecting the various parts, serves as a retainer for the plate.



The machine will be found especially adapted for severing cotton bale bands and similar articles while being manufactured, wherein it is frequently desired to sever the bands in bundles or in numbers at the same time, and requiring a relatively strong machine to accomplish it. With this simple device, as many of the bands may be severed at the same time as the V-shaped recess will hold.

## PATENTS, CAVEATS, TRADE MARKS, COPYRIGHTS, AND DESIGNS. TWENTY-FIVE YEARS PRACTICE

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## LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

CORTELYOU et al. v. CHARLES ENEU  
JOHNSON & CO.

BRODRICK COPYGRAPH CO. OF NEW  
JERSEY v. SAME.

(Circuit Court, S. D. New York.  
138 F. R. p. 110.)

### 1. PATENTS—CONDITIONAL SALE OF PAT- ENTED MACHINE—VALIDITY OF RE- STRICTION ON USE.

It is competent for the owner of a patent for a rotary neostyle, used for stencil duplication, to sell such machines under a license restriction that they shall be used only with paper and ink made by the licensor, it being necessary to the successful operation of the machine that such supplies shall be of a special kind and quality, and any use of the machine with other supplies will constitute an infringement of the patent.

### 2. SAME—NOTICE OF CONDITION.

In such case a written contract of license embodying such restrictions is not necessary, but purchasers and users are bound by a notice thereof placed conspicuously on the machine itself.

### 3. SAME—CONTRIBUTORY INFRINGEMENT.

A defendant who, with knowledge that a patented machine is sold subject to a license restriction that it is to be used only with supplies made and sold by the licensor, induces such licensees to violate such restriction and infringe the patent by buying and using with the machine supplies made by himself, is chargeable with contributory infringement.

IRONCLAD MFG. CO. v. DAIRYMEN'S  
MFG. CO.

SAME v. ORANGE COUNTY MILK ASS'N.  
(Circuit Court, S. D. New York.  
138 F. R. p. 123.)

### PATENTS—INFRINGEMENT—MILK CANS.

The Haigh patent, No. 607,433, for a milk can, the essential features of which are in the construction of the neck portion, which is double, one part fitting over the other, one having a flaring re-enforcing flange, and the other an annular recess, forming together, when closed, a flush-joint interlocking means, while not strictly a pioneer patent, discloses patentable invention in a marked degree, and is entitled to a liberal range of equivalents; the can shown being stronger in the neck portion, and also more sanitary, than any in the prior art. Also held infringed.

UNITED SHIRT & COLLAR CO. et al. v.  
BEATTIE et al.

(Circuit Court, N. D. of New York.  
138 F. R. p. 136.)

### PATENTS—INVENTION AND INFRINGEMENT— FOLDING MACHINE.

The Pine patent, No. 645,871, for a folding machine designed and used for folding the edges of collars, cuffs, and like articles, was not anticipated in the prior art, and covers a true combination, which discloses novelty and patentable invention. Also held infringed.

ROBINSON v. S. & B. LEDERER CO. et al.  
(Circuit Court, D. Rhode Island.  
138 F. R. p. 140.)

### PATENTS—ANTICIPATION—SWIVEL.

The Robinson patent, No. 452,320, for an improved swivel hook, held not anticipated, valid, and infringed, and the patentee not barred from relief by laches, on a motion for preliminary injunction.

WERCKMEISTER v. AMERICAN TO-  
BACCO CO.

(Circuit Court, S. D. New York.  
138 F. R. p. 162.)

### COPYRIGHT—ACTION TO RECOVER PENALTY FOR INFRINGEMENT—EVIDENCE.

In a suit under Rev. St. § 4965 [U. S. Comp. St. 1901, p. 3414], to recover the penalty of \$10 for each infringing copy of a copyrighted painting in defendant's possession, the judgment in a prior action in replevin brought under the same section, in which plaintiff recovered the infringing sheets, is not evidence that they were found in defendant's possession, although it recites that such was the fact, since that question was not an issue, nor a finding upon it essential to a forfeiture of the sheets.

AMERICAN CARAMEL CO. v. THOMAS  
MILLS & BRO.

SAME v. QUAKER CITY CHOCOLATE  
& CONFECTIONERY CO.

(Circuit Court, E. D. Pennsylvania.  
138 F. R. p. 142.)

### PATENTS—INVENTION—MACHINE FOR CUT- TING CARAMELS.

The Hershey patent, No. 532,554, for a machine for cutting candy, is void for lack of patentable invention in view of the prior art.

INTERNATIONAL MFG. CO. et al. v.  
H. F. BRAMMER MFG. CO.

(Circuit Court of Appeals, Eighth Circuit.  
138 F. R. p. 396.)

### 1. PATENTS—INFRINGEMENT—MECHANICAL EQUIVALENTS.

In determining the question of infringement of a patent covering a new combination of elements the form of the several parts has but little weight; the correct rule being that parts which perform substantially the same function, in substantially the same way, and produce the same results, are mechanical equivalents.

### 2. SAME—INFRINGEMENT—MECHANICAL MOVEMENT.

The Plagman patent, No. 608,220, for a mechanical movement for use in washing machines, the purpose of which is the translation of the continuous rotary motion of a horizontal shaft in the same direction into the reciprocating rotary motion of a vertical shaft in an opposite direction, covers a new combination, and is entitled to a fairly liberal construction and application of the doctrine of equivalents, and as so construed is infringed by the device of the Martin patent, No. 736,255.

MOORE v. MEYER-SNIFFEN CO.

(Circuit Court of Appeals, Second Circuit.  
138 F. R. p. 402.)

### PATENTS—INFRINGEMENT—OVERFLOW FOR WASH BASINS.

The Moore patent, No. 379,973 for an overflow device for wash basins, bath tubs, etc., is of doubtful validity in view of the prior art, and, if conceded to show patentable invention, is entitled to only a very narrow construction, which limits it to the precise structure shown. As so construed, held not infringed.

MAHONEY v. JENKINS et al.

(Circuit Court of Appeals, Third Circuit.  
138 F. R. p. 404.)

### PATENTS—INFRINGEMENT—MULTIPLYING CAMERA.

The Jenkins patent, No. 620,036, for a multiplying camera, consisting of a cellular box, the rear end of the cells being closed by a plate holder, and having a sliding front on which the lens is mounted and moved both horizontally and vertically, registering successively in front of each cell, is not infringed by a camera in which the box is not cellular, but which has a single tube fastened to the slide back of the lens and moving with it to successive positions; such device, while accomplishing the same result, having no mechanical equivalent for the cellular box, which is the fundamental element in the patented combination.

DOTEN v. CITY OF BOSTON.

(Circuit Court of Appeals, First Circuit.  
138 F. R. p. 406.)

### PATENTS—DAMAGES RECOVERABLE FOR IN- FRINGEMENT—PROFITS.

The owner of a patent may recover from the user of an infringing device as profits the amount saved by defendant by the substitution of such device for one previously used, although the saving resulted from the fact that the devices previously used were frequently broken through accident or the carelessness or miscalculation of employees or others having to do with their use, while the patented device was not subject to such breakage, where the accident and carelessness are recognized to be appreciable sources of danger to employers in like case, and where there is evidence from which the amount of the saving can be estimated with reasonable accuracy.

COUP v. McCONWAY & TORLEY CO.  
et al.

(Circuit Court of Appeals, Third Circuit.  
138 F. R. p. 411.)

### PATENTS—INFRINGEMENT—CAR COUPLERS.

The Comp patent, No. 401,775, for a car coupler, occupies a narrow field, and must be strictly limited in construction, being for an improvement on couplers of the well-

known Janney type, designed to adapt the same, after the coupling has been made to track curvature by means of a pivoted connection between the drawhead and drawbar which allows the drawhead to "swing freely laterally," and, since both free and nonfree joints were known in the prior art, the patentee must be held to have adopted the former; and the patent is not infringed by a coupler in which the drawhead, while pivotally connected, does not swing freely, but has its movement restricted by side bars, and controlled by springs, which hold it normally in a central position.

GENERAL ELECTRIC CO. v. BULLOCK  
ELECTRIC MFG. CO.

(Circuit Court, D. New Jersey. 138 F. R.  
p. 412.)

### PATENTS—SUIT FOR INFRINGEMENT—IN- JUNCTION.

To a bill alleging infringement of certain letters patent, the defendant filed a plea setting up that from a certain date, which was 15 days before the filing of the bill of complaint, it had not infringed the complainant's devices, and that it had on the day named leased and surrendered all its plant, tools, machinery, stock on hand, and good will to another, without stating to whom they were leased or the length of the demise, and further stating that on the day named it had in good faith ceased the manufacture, sale, and use of the alleged infringing devices, and since that time had had no intention, "and now has no intention," of manufacturing, using or selling the same. Held, that the plea was insufficient in view of the uncertainty of the lease, and of the fact that the defendant had infringed, and that the bill alleged that "the defendant now continues, and threatens to continue, to make use, and sell" the alleged infringing devices. Held, further, that the complainant is entitled to greater security against a confessed infringer than the mere statement that it has no present intention of further infringement, or even the statement that it will not further infringe.

UNION WAXED & PARCHMENT PAPER  
CO. v. SEVIGNE BREAD WRAPPER CO.

et al.

(Circuit Court, D. Vermont. 138 F. R. p. 415.)

### JUDGMENT—SUIT TO SET ASIDE FOR COL- LUSION—ACTION BY ONE NOT A PARTY.

That defendants are exploiting a collusive decree adjudging the validity of a patent which is in fact invalid does not entitle a third person, not a party to such decree, nor bound thereby, to have the same set aside, after several terms of court have elapsed, and be admitted to defend the suit, nor to injunctive relief against such exploitation.

OEHRLE et al. v. WM. H. HORSTMAN  
CO.

(Circuit Court of Appeals, Third Circuit.  
138 F. R. p. 561.)

### PATENTS—INFRINGEMENT—ORNAMENTAL CORDS.

The Oehrle patent, No. 599,191, for an improvement in ornamental ropes or cords, construed, and held not infringed.

MURRAY v. ORR & LOCKETT HARD-  
WARE CO.

(Circuit Court of Appeals, Seventh Circuit.  
138 F. R. p. 564.)

### PATENTS—INFRINGEMENT—STORE SERVICE LADDERS.

The Murray patent, No. 442,531, for a store service ladder, in which the weight of the ladder and the person thereon is supported by travelers on the base shelf or floor, and having hooked bearings near the upper end, which engage with a rod, to prevent tilting or displacement, was not anticipated in the prior art, and discloses patentable invention. Also held infringed.

CURTAIN SUPPLY CO. v. NORTH  
JERSEY ST. RY. CO.

(Circuit Court, D. New Jersey. 138 F. R. p.  
734.)

### 1. PATENTS—INFRINGEMENT—SHADE-HOLD- ING DEVICE.

The Forsyth patent, No. 559,446, for a shade-holding device for use chiefly on the shades in car windows, discloses invention, and is valid, but, in view of the prior art, is limited to the self-righting feature which is its essential element, by means of which the bottom of the shade, when pulled or pushed out of the horizontal, will automatically re-assume such position. As so construed, held not infringed by the device of the Hoyt patent, No. 676,557.

### 2. SAME.

The Paterson patent, No. 659,175, for shade fixture, claims 1, 2, and 3, are invalid, and, as limited by the prior art, held not infringed.

LAFFERTY MFG. CO. et al. v. ALUMINUM  
RY. SIGNAL & MFG. CO.

(Circuit Court of Appeals, Seventh Circuit.  
138 F. R. p. 729.)

### PATENTS—INVENTION—RAILWAY TORPEDOES.

The Bevington patent, No. 474,718, for a railway torpedo, is for a combination of elements all of which were old, and differs from prior structures only in the substitution of paper for tin or other metal as material for the dome-shaped cap, which does not constitute patentable invention, the only advantage shown being in the lessening of the cost.

ELECTRIC BOOT & SHOE FINISHING  
CO. v. LITTLE et al.

(Circuit Court of Appeals, First Circuit.  
138 F. R. p. 732.)

### PATENTS—NOVELTY—PROCESS OF FINISH- ING BOOT AND SHOE SOLES.

The Crocker process, patent No. 11,144, claim 1, for a process of polishing and finishing sole and heel edges and other parts of boots and shoes, is void for lack of patentable novelty in view of the prior art.

AMERICAN SEWAGE DISPOSAL CO. v.  
CITY OF PAWTUCKET.

(Circuit Court of Appeals, First Circuit.  
138 F. R. p. 811.)

### PATENTS—INFRINGEMENT—SEWAGE APPAR- ATUS.

The Glover patent, No. 559,522, for a sewage apparatus comprising a series of stationary primary filter-beds having a structure inclosing the same, and a series of secondary filter-beds open to the air, does not include as an element of the combination a septic tank, nor do the primary filter-beds operate on the principle of septic or putrefactive action, to liquefy the sewage, but of sedimentation and filtration. As so construed, held not infringed by an apparatus using a septic tank.

WESTINGHOUSE ELECTRIC & MFG  
CO. v. STANLEY INSTRUMENT CO.

(Circuit Court of Appeals, First Circuit.  
138 F. R. p. 823.)

### 1. PATENTS—SUIT FOR INFRINGEMENT— LEAVE TO FILE BILL OF REVIEW.

Where it is claimed that a patent in suit, and against infringement of which an injunction is sought, expired pending an appeal, because of the expiration of a foreign patent for the same invention, the facts in relation thereto should be presented to the appellate court on or before the hearing on the merits; and the defendant is chargeable with laches, if he fails to so present them; which will warrant the court in denying him leave to file a supplemental bill, in the nature of a bill of review, to enable him to present the question after the case has been finally determined on the merits, unless on terms named in the opinion.

### 2. SAME—LIMITATION OF TERM BY FOREIGN PATENT—CONSTRUCTION OF STATUTE.

The provision of Rev. St. § 4887, as it stood before its amendment in 1897, that "every patent granted for an invention which has been previously patented in a foreign country shall be so limited as to expire at the same time with the foreign patent," is plain and unambiguous, and not to be extended by construction, and applies only to cases where the inventions actually claimed in the foreign and domestic patents are identical; it is not sufficient that the foreign patent may disclose the invention of the later United States patent, where it is not therein claimed.

### 3. SAME—ELECTRIC MOTORS.

The terms of the Tesla patents Nos. 511,559 and 511,560, for an improved method and means of operating electric motors, held not limited by prior British patents, to the same inventor, because the latter do not claim the same inventions.

McKENZIE FURNACE CO. et al. v.  
GREEN ENGINEERING CO.

(Circuit Court of Appeals, Seventh Circuit.  
138 F. R. p. 830.)

### PATENTS—INVENTION—FIRE-ARCH FOR FUR- NACES.

The Green & Gent patent, No. 676,606, for an improvement in fire-arches for furnaces is void for lack of patentable invention in view of the prior art, and the use of the same combination of elements in fireproof ceilings.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Solon A. Owens, Young, Texas. Clothes Line.—It is the aim of this invention to dispense with the use of clothes pins, and the clothes line operates to both clamp and support the clothes. It is composed of links having overlapped portions provided with eyes, the latter slidably receiving the links and permitting the same to move on each other to receive and clamp the clothes.

Thomas J. Blagg, Boise, Idaho. Ironing Board.—This invention provides means for stretching a shirt or other garment automatically to remove the wrinkles previous to ironing such garment. The device for stretching the garment is automatically thrown out of operation, when the board is raised either to receive a garment or to permit the removal of the same. This device is thrown into operation when the ironing-board is swung downward into a horizontal position. The ironing-board is hinged, and the extensible garment stretching device is mounted on it. A weighted lever is connected with the stretching device for placing the same under tension. Means are provided for limiting the downward movement of the weighted lever, and the garment stretching device is thereby released when the ironing-board is swung upward.

George W. Gapen, Milwaukee, Wis. Lubricator.—This invention is designed for lubricating the air pistons of air pumps in compressed railway brake systems, and it supplies the lubricant when the pump is operating to change the main reservoir. It is controlled by the pump, and will operate either fast or slow according to the rapidity with which the pump is operated. The lubricator comprises a body, an air supply pipe in communication with the top of the body, a feed tube at one side of the body in communication with the upper portion thereof, a pipe disposed longitudinally within the body with its upper end in communication with the feed tube, a valve for the lower end of the pipe, a valved passage from the feed tube to the air pipe, and a valve operating in the air pipe and located above the valved passage.

Mason P. Carpenter, inventor; Mexico, Mo., Waller L. Reed, same place, assignee. Three Patents. Automatic Brakes for Elevators, and Nut Lock.—Two of the patents are directed to automatic brakes for elevator cars and various other movable devices. The first brake patent is provided with an adjustable automatically operable device adapted to be thrown into operation through centrifugal force when the speed of an elevator car increases beyond a predetermined point. This adjustment enables the brake to be set so that it will operate at any excessive speed of a car. This brake embodies a rotary member normally held in an inoperative position by a spring, and a locking dog for engaging a relatively fixed part arranged in the path of the rotary member when the latter is thrown outward by centrifugal force.

The second brake patent is also automatically operated, and is adapted to prevent an elevator car from dropping to the bottom of the shaft, should the cable break or the car otherwise become disconnected

from the controlling devices. It will stop the car gradually after the same has moved but a few inches, and it produces the same effect on the occupants as an ordinary stop. A pair of brake levers is arranged at each side of the car for gripping the track of the elevator shaft, and these levers are thrown into engagement with the tracks by a double cam, which is carried by a spring actuated lever. The spring actuated lever is automatically released when the car moves downward too rapidly.

The third patent covers a nut lock of universal application, adapted after it has been set or locked, to permit the nut to be screwed further inward on the bolt, should the part become loose. It consists of a locking plate having nut engaging means, and provided with a bolt opening and an annular series of flexible bolt-engaging V-shaped cutting points surrounding the bolt opening and separated by intervening notches. The points are of a thickness in excess of the width of a groove of the threads. The circle described by the apexes of the points when the latter are at an angle to the plate or inclined, is greater than the diameter of the bolt, and is less than the diameter of the bolt when the points are arranged in the same plane as the locking plate. The apexes of the points terminate short of the body of the bolt, and are thereby adapted to plow through the threads when the nut is screwed further inward on the bolt.

Stephen J. Meyerpeter, Chicago, Ill. Holder.—This invention relates to means for holding a pencil, pen and the like, in the pocket. The device is an exceedingly simple one, and yet entirely effective. It comprises a rear wall having a reinforcing core plate and a sheath covering the same, with a non-reinforcing, flexible opposite front wall, secured to the rear wall. Yielding bands mounted on the inner faces of both walls, and in opposing relation to each other, are provided with overlapping teeth between which the pencil or pens are passed. Suitable means are provided for securing the device in the pocket.

Russell A. Brown, Salina, Kansas. Register.—The subject matter of this invention is a combination desk and register, for use in hotels and similar places, the object being to provide a convenient structure of this character. A desk body is employed, having a central opening, across which passes a web of paper constituting the register, this web being wrapped upon rollers journaled in the desk. Upon the exposed portion of the web the signatures of the guests are written. Panels for receiving advertising cards and the like are arranged in the desk top.

Rufus L. Clark, Estill, S. C. Guide for Sewing Machines.—The device is an improvement which may be readily applied to any ordinary machine. A guide is employed together with means for securing the same on the bed plate of a sewing machine. A gauge is also employed having inwardly extending hooks that slidably intermesh with the edges of the guide. This gauge also has an upstanding, intermediate, loop portion, located over the guide, and between the hooks. A holding cam is journaled within and to the upstanding loop portion, and is arranged to clamp upon the guide, thereby holding the gauge against movement.

David L. Gensbigler, Derry Station, Pa., inventor; Daniel F. Updegraff, Youngwood, Pa., assignee, half interest. Device for Lubricating Journals of Car Wheels.—This patent relates to an ingenious device, which is not only

adapted to continuously lubricate the journal of a car wheel, but it is also capable of maintaining the journal in a highly polished condition to prevent the grinding and wearing, due either to a rough journal or to the presence of grit in the lubricant. This result is obtained by a combined lubricating and polishing roll, which yieldably engages the surface of the journal. Adjusting means are provided for controlling the pressure of the roll against the journal so that the abrasive action of the former will result only in polishing the latter.

Alexander B. Kokernot, New Orleans, Louisiana. Machine for Holding Refrigerator Tubes.—The machine covered by this patent is an improvement on the other machines formerly patented by the same inventor. In a type of barrel patented by the present inventor is a tube, which is employed in holding the refrigerant. This tube is removable, and the machine is employed for holding the same while being placed in or removed from the barrel. A tubular support is employed in the top of which is located a tube receiving seat. Upright rock shafts, journaled in the support, have inwardly extending fingers that are movable into and out of the seat and are thus arranged to engage and hold a tube placed therein. A lever has a connection with the rock shafts for operating the same. A refuse receiving cup is removably located in the support below the seat, and has a perforated bottom provided with depending drain nipples.

Alexander Weaver, Mountain View, Mo., inventor; W. S. Kenaga, same place, assignee, half interest. Lubricator for Car Journals.—It is the object of the present invention to automatically lubricate the journals of the wheels of a car while the latter is in motion, and to prevent a flow of the lubricant when a train stops. The device is provided with a reservoir having a plurality of distributing tubes for conducting the lubricant to the journals. A vertically movable piston pierces the top of the reservoir, and is arranged to be engaged by the body of a car, as the latter rocks through the motion of the train. The piston is provided with a perforated plate or head, and is normally supported in an elevated position by springs which also maintain the valves of the tubes normally closed. The stems of the valves are connected with the plate or head, and when the piston is depressed by the rocking motion of the car body, the valves are opened and a quantity of lubricant is forced through the distributing tubes. This automatic lubrication of the journals continues while a train is in motion, and as soon as a train stops, the springs close the valves and shut off the flow of the lubricant.

James M. King, Talmage, Nebraska. Pruning Implement.—The principal object in this invention is to provide an implement in which the shear cut will sever the limb from above, thereby avoiding the pinching, and perhaps bending of the blade, and at the same time by the bending of the limb securing the opening of the cut to permit the free action of the blade. To this end a standard is provided on which spaced upstanding arms are mounted. An actuating rod is slidably mounted on the standard and carries an overhanging cutting hook having a depending bill. A cutting blade is pivoted at its upper end to the upper portion of the cutting hook, while its other end has a pivotal connection with the upper ends of the arms, said latter end being provided with a downwardly extending curved holding hook that is movable between

the arms, and forms therewith a limb holding clamp.

James M. King, Nebraska City, Nebr. Washing Machine.—The washing machine of this patent receives an ordinary wash tub and operates on the clothes therein. The bench for supporting the tub and the washing mechanism are compactly folded together when not in use. The bench has foldable legs, and a hinged standard is mounted on one end of the bench and is provided with a vertical pivot. A horizontally swinging frame is connected at its back with a pivot, and at its front with upper and lower horizontal oscillatory bars by means of a hinge joint. The oscillatory bars are swung upward and downward to operate the pounder, which is adapted to be moved to any portion of the tub. An operating handle is connected with one of the oscillatory bars.

Daniel F. Updegraff, Youngwood, Pa. Miter Box.—This invention relates to saw guiding means for cutting the ends of timber and the like, and suitable bevels for mitre joints. The object is to provide a simple structure that can be adjusted to cut a wide range of angles and bevels, and furthermore, to provide an extensible and contractible saw guiding device which will be of sufficient length to properly direct a saw the entire distance across the lumber being cut. A base is provided on which is pivotally mounted a saw guiding device, that includes a hinged hood and a longitudinal guide blade, slidably associated with the hood. The base is arranged to be placed directly upon the article to be cut, and the hood can be adjusted so as to guide the saw practically in any direction desired.

Samuel A. Spangenberg, Belleville, Ont., Canada. Hair Curler.—This invention relates to that class of curlers upon which the hair is wrapped and left for a considerable period of time, as distinguished from curling irons and like devices. A supporting element is employed comprising a spool having heads, and a flexible flap is mounted on a cylinder that is journaled on the spool. The hair is placed against this flange, and wrapped with it upon the cylinder, the whole being held together by clamping fingers hinged at their outer ends to the spool, and having heads at their free ends that are adapted to lock over the flap when the same is wrapped upon the cylinder.

George M. Hanger, Bridgewater, Va. Hand Plow.—This implement belongs to that class known as garden plows. It consists of a main standard having a down-turned rear end and forwardly projecting side bars. A ground wheel is journaled to and between the side bars, spaced handle bars have their lower ends located adjacent to the front ends of the side bars, and a supplementary standard has side bars that embrace the wheel. These latter bars are secured to the lower ends of the handle bars, and have their ends disposed at the ends of the side bars of the main standard. Pivots pass through the contiguous ends of the handle bars, and the side bars, and supporting means connect the handle bars and the main standard.

George M. Hanger and Daniel S. Thomas, Bridgewater, Va. Plow.—This invention relates to the same class of plows as the one above described, and is a much more simple construction. A beam member is employed that comprises spaced side bars, having down-turned rear ends forming a standard. A wheel is located between the side bars, and an axle for the wheel is connected to the front ends of the beam bars. Handle bars have their front ends pivoted on the axle, and novel mechanism is employed for connecting the side bars and the handle bars.





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**FOR SALE**—U. S. Patent No. 804,127, dated Nov. 7, 1905. Improved rail or other joint, without nuts or bolts, or fishplates. Correspond with inventor, W. J. Huckabay, Sparta, La. feb

**FOR SALE**—Patent No. 804,106, dated Nov. 7, 1905. Combined fire place and stove. Can be arranged within or without a fire place, and may be used with either wood or coal. Correspondence solicited. Address, Walter A. Douglass, Pilot Mountain, N. C. feb

**FOR SALE**—Patented No. 794,328. End gate for wagon beds, dated July 11, 1905. A rodless wagon end gate. Will sell for \$5,000. Address, Henry Weber, Fairbury, Ill. feb

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**FOR SALE**—Patent No. 798,953, dated Sep. 5, 1905. Safety Stirrup for Saddle. Very simple and strong, and always ready to release the foot when required. Address, C. F. Eldenburg, No. 34 2nd. Avenue, Spokane, Wash. feb

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**FOR SALE**—Patent No. 798,787. Automatic Buoy for locating the whereabouts of sunken ships. The attention of the Marine Underwriters and Savage and Wrecker Co's. is called to it; also the Navy Department. Address, Archibald Hattan, No. 11 Charles Street, Kingston, Canada. feb

## WANTED.

**WANTED**—Manufacturers to make a working model for testing an apparently meritorious invention, a phonographic instrument. Or capitalist to invest a few dollars as speculation with interest in the invention. Address, J. Isakson, Box No. 36, Bonner, Montana. mar

**WANTED**—Patent No. 793,856, dated 1905. Infants' Toilet Box. Leather covered box—apartments for all articles—needed for bath—trays for cloth and safety pins. Suitable for lady's satchel or home use. Address, Study Box Company, 624 E. Wayne St. Fort Wayne, Indiana. jan

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## The Work of the Patent Office.

The order under which the examining divisions of the Patent Office are working, requires that amended cases should be given precedence. While this has resulted in certain divisions falling in arrears in new applications, the conditions within the Patent Office are, on the whole, more satisfactory than under the old system, when each examining division was allowed to do as it pleased about amended cases, with the result that, in many instances, amended applications were actually held back and new applications given precedence, notwithstanding the rules of practice require that a contrary course be pursued.

From the report of the condition of work at the close of business, January 9, 1906, it appears that all but 11 of the 18 divisions of the Patent Office were only one month in arrears in amended cases. Of the remaining 11 divisions, 10 were between one and two months in arrears in amended cases, while the eleventh division was between two and three months.

We hope that the Commissioner will continue the order in force, for we believe that those who have business before the Patent Office, will profit by the new order of things. An inventor can stand waiting five or six months for an official action on his application, if, after the first official action, its future consideration is not delayed within the Patent Office. Most inventors expect, as soon as their applications are reached by the Patent Office, that they will be allowed. Any considerable delay, after the first action, is a matter that cannot be explained, and is apt to be misconstrued.

## The Test of Invention.

During the consideration of applications for patents, the question of lack of invention in the matter claimed, is constantly brought up by the Patent Office examiners. Later, when the patent gets into the courts, the same objection is urged against the invention. It is an objection easily made, but one incapable of dis-

proof. There is no affirmative test of invention. The line of demarkation between mechanical skill and invention has never been clearly drawn. As stated by a learned judge in a patent case, "If there be one test which, more than others, is helpful in adjusting the sense of perspective, and in promoting a realization of due relation between mechanical skill and invention, it is to be found in the appreciation of unexpected possibilities of adaptations to meet exigent demands which result in successful operation and effect."

In other words, the existence of a long-felt want: the creation of an invention to fill that want; and its successful use, all combine to outweigh specious arguments which may be advanced to defeat a patent by an infringer.

## Marconi Wins.

Our readers will be interested in learning that the circuit court of the United States for the southern district of New York, has decided in the suit of the Marconi Wireless Telegraph Co. vs. The DeForest Wireless Telegraph Co., that the Marconi patent discloses "the first practical wireless telegraph system and shows invention of a primary character," thus practically giving to the Marconi company the same monopoly in the wireless telegraph field, that Bell was awarded in the telephonic field. This result was not accomplished without much opposition, the defendant introducing various prior disclosures, patents, publications, etc. to defeat the Marconi patent. For instance, a man by the name of Harry Shoemaker testified that in April 1895, when he was a boy of 16, he constructed and used a complete system of wireless telegraphy, which as now described, is a complete anticipation of the Marconi patent. As to his testimony, the court said "It is so utterly unsupported and insufficient and improbable that it will not be discussed."

The Court in summing up the defenses said.

"It would seem, therefore, to be a sufficient answer to the attempts to belittle Marconi's great invention that, with the whole scientific world awakened by the disclosures of Hertz in 1887 to the new and undeveloped possibilities of electric waves, nine years elapsed without a single practical or commercially successful result, and that Marconi was the first to describe and the first to achieve the transmission of definite intelligible signals by means of the Hertzian waves.

"The exact contribution of Marconi to the art of spark telegraphy may be stated as follows: Maxwell and Crookes promulgated the theory of electrical oscillations by means of a disruptive discharge. Hertz produced these oscillations, and described their characteristics. Lodge and Popoff devised apparatus limited to lecture or local experiments, or to such impracticable purposes as the observation of thunderstorms. Marconi discovered the possibility of making these disclosures available by transforming these oscillations into definite signals, and, availing himself of the means then at hand, combined the abandoned and laboratory apparatus, and, by successive experiments, recognized and adapted and developed them into a complete system, capable of commercially utilizing the discovery."

## Non-Refillable Bottles.

In each week's issue of patents there will be found the notice of one or more patents granted on bottles which cannot be refilled. Several hundred of such patents have already been granted, and it will be years before the craze is over and patents on such articles cease to issue with the present regularity. So numerous have the patents become, that quite a number of sub-classes have been formed, and it is not too much to say that there is no class of inventions which is more examined into, by both the Patent Office and the attorneys, than this particular class. Yet twenty years ago, no one had ever heard of a non refillable bottle. The necessity for one had not dawned on the mind of the average inventor.

We are advised that the present demand for a non-refillable bottle grew out of an alleged offer by a man named Pepper of Kentucky, a whiskey distiller, who, it is currently reported, has since failed in business. Probably for self-advertisement, he let it be known through the papers that he would give \$20,000 to any one who would originate a bottle which could not be refilled. It appears he had found that bar-keepers, after purchasing a bottle of his whiskey, would, when the supply had run out, simply refill the bottle, using a cheaper and poorer grade of whiskey. As the bottle still contained the label of the Pepper whiskey, customers supposed that the stuff that was given to them from the bottle was the Pepper brand, when in fact, it was something different, the result being that Pepper whiskey lost caste in the minds of customers. Whether he would ever have paid the \$20,000 or not is a question which need not be considered, for the fact is that today he is in no position to do so because of financial difficulties.

Apart from this, what demand there is for a bottle that cannot be refilled, comes principally from manufacturers of Worcestershire sauce, catsup and other articles which are sold and dispensed in the original bottle, because of which it is easy to substitute something different when the original contents of the bottle is exhausted. We have no doubt that such manufacturers would welcome an invention which aimed to prevent the proprietor of a restaurant from refilling bottles of catsup, Worcestershire sauce, etc., when the bottles are empty. The problem is a difficult one to solve, and no one appears to have reached the goal. The trouble with most inventors' schemes is that they make their bottles too expensive for commercial purposes, and even impossible to construct. Inventors fail to realize that the bottle should be made of glass, and that you cannot blow or mold glass except along certain well-defined lines. In fact, most of the patents which have been issued are objectionable because of the absurdly impracticable constructions which have been devised to remedy the evil complained of. Valves, springs, levers and various mechanical elements and devices have been brought into play to form wonderful complex

combinations, with the thought that it was only necessary to prevent the bottle from being refilled, and that all other considerations, such as cost of manufacture, simplicity of construction, etc., should give way. As an official of the Patent Office stated some time ago, the issuance of patents on non-refillable bottles is a big fake scheme, in which the Patent Office is an innocent party; for they are obliged to issue the patents because the inventions presented are "novel;" though any one can see that the inventions are impracticable from the standpoint of the manufacturer. While the statute requires that the article should be both novel and useful, both the Patent Office and the Courts have decided that the question of utility need not be closely inquired into. Indeed, unless the invention is, on its face, inoperative, the Patent Office will grant the patent. It will be probably urged that the Patent Office ought to examine with more care the utility of the invention; but to investigate this question in every case is clearly beyond the scope of the Patent Office and quite impossible of correct execution.

## Too Much Secrecy.

Inventors as a class are suspicious and entertain a lively distrust for everyone. While a reasonable amount of secretiveness is to be commended, it is a fact that the practice of too much secrecy often defeats its own end. We have in mind the case of an interference in the Patent Office where the inventor, who was one of the parties thereto, was unable to show conception of his invention for the reason that he had failed to disclose it to a single person prior to presenting the matter to the attorney whom he had employed to file an application for patent. The earliest date he could establish was that on which he appeared at the attorney's office and disclosed his invention; although he had had the idea in mind for many months prior to that time, and had actually completed it in full size form several weeks prior to his visit to his attorney. The other party, although subsequent to him in the actual conception and completion of the invention, had taken the precaution to disclose it to a few trusted friends; and when the interference arose, had the evidence on hand by which to establish his dates. In this particular instance, the real prior inventor lost his rights because he had no proof of his priority. If he had told his wife about it, or any near friend, his position today would be secure.

It is not so long ago though that the testimony of a wife could not be accepted in patent interference cases. The reason for this was that all interference contests are conducted before the Commissioner of Patents domiciled within the District of Columbia, where the law was (up to a few years ago) that a wife could not testify for or against her husband. When the new code went into effect within the District of Columbia permitting a wife to so testify, all this was changed. Since the decision of Commissioner Allen in *Pattee vs. Cook* C. D. 1903 p. 446, it has been the practice to accept the



testimony of the wife in interference contests arising within the Patent Office.

If the aforesaid inventor had prepared a drawing and written description of his invention, and then appeared before a notary public and had sworn to the same, he would not have been obliged to have disclosed the invention to others, and at the same time, he would have had proof to establish priority. It is a serious mistake for any inventor to go through the steps of completing an invention and bringing it to perfection, without taking some one into his confidence, or providing some means by which he can prove the dates of conception and completion; for the courts will not accept the inventor's unsupported statement.

#### Classify the Foreign Patents.

Before an application for patent is made, the records of the Patent Office are usually searched for the purpose of determining whether or not the invention is anticipated by prior patents. The 800,000 U. S. patents which have been issued, are classified in such a way that quite frequently it is only the work of a few hours to examine the drawings of patents already granted, in the particular matter under consideration, whereupon any anticipations are brought to view. The search can be made with reasonable accuracy. It is, however, unfortunate that attorneys and inventors are debarred from examining foreign patents, in making their preliminary examinations. In many instances the foreign patents are more pertinent than U. S. patents. In certain arts, foreigners are ahead of the inventors in this country. Though it would involve much expense to provide what is known as the attorney's room of the Patent Office with a complete set of foreign patents for examination purposes, we believe that the time will come when this will be demanded by the attorneys, and conceded by the Patent Office as a reasonable request. There would be fewer applications filed if attorneys were permitted to examine foreign patents. To this extent the work of the Patent Office would be lightened; and what relieves the Patent Office of work, should be encouraged as a necessary forward step in the scheme of examination.

#### Useful for Hydraulic Engineers.

Through the Abner-Doble Company of San Francisco, California, we are in receipt of a handsome catalogue entitled, "Doble Tangential Water Wheels," an invention which was written up in the July 1905 issue of the AGE.

The first portion of the catalogue contains general matter descriptive of the essential features entering into the construction of the wheels. Illustrations of several of the different types of water wheels are followed by descriptions of some of the typical hydro-electric power plants, in which Doble water wheels are operating. Among these may be noted the plants established at Connell University, Ithaca, N. Y.; Edison Electric Company, Los Angeles, Cal., and Ontario Power Co.,

Southern California. The latter portion of the book contains the Doble water wheel tables, covering all conditions of water power up to a head of 2550 feet, and in capacities up to 5000 horse-power. Other tables relate to the loss of head in pipes by friction, riveted steel pipes, etc. Much useful hydraulic information is gained by reading this portion of the book. It is a handy reference book for hydraulic engineers.

Copies of the catalogue may be obtained by writing to the company, who is anxious to place it in the hands of persons interested in water power development.

#### Electroplating Lace.

The production of metallized lace is another new industry; but like many another new industry, it is simply a new application of an old method. The galvano-plastic art is employed in this case. One of the first uses of the galvanic current was to coat certain articles with metallic substances, and gilding, silver and nickel plating, bronzing, etc., continue to be done in that way. It cannot, however, be employed on articles that are non conductors of electricity. Experiments were tried long ago to make such non-conductive articles susceptible to the galvano-plastic process, either dry or wet, by sprinkling them with a very fine powder of metal or graphite, or by immersing them in a solution of metallic salts. In this manner many articles, such as flowers, leaves, fruits and branches, and even delicate articles, were given a metallic coating. Some years ago, an Italian scientist even introduced metallized parts of corpses to serve for medical demonstration.

A chemist of Brussels has devoted attention especially to giving embroideries this metal wash, and has created beautiful effects. Until recently, however, they could not be made of practical value; but thanks to a recent invention, the products of the new art are being placed upon the market.

Laces are mainly treated. In a few minutes they are made conductors of the electric current and placed in a galvanic bath. Under the influence of a current of about 3 volts, they become coated with an exceedingly delicate metal surface, the colors of which and other properties can be regulated *ad libitum*. The coating is so fine that not the slightest irregularity can be noticed, and the laces remain perfectly soft and flexible. It makes no difference whether gold, silver, copper, bronze or other metals are employed.

Another novelty is that the metallized points, in spite of the thinness of the metal coating, can be united as if soldered together, so that all sorts of combinations are possible. These goods are used for table ornaments, for decorations of furniture, wainscotings, and for incrustation of fine woods. The laces can even be polished. Fashion will try what effect such gold or silver laces will have when used as trimmings for dresses. The chances for the industry are considered favorable.

#### Diamond Cutting in the United States.

In the brief period—a little more than a decade—during which the diamond cutting industry has been conducted on a commercial scale in the United States, it has advanced with such rapid growth that this country now commands a foremost position among the diamond cutting nations of the world. It is estimated that the saving in labor to this country in this industry alone, during the last five years, has been over \$10,000,000: it has not only given remunerative employment to many men, but it has kept this large sum of money in the country.

The ingenuity and enterprise of the American cutters have been material factors of their success. In Amsterdam, the acknowledged home of the industry, where it has been conducted for more than a century, no innovations have been introduced. Diamond cutting is still done by the ancestral rule-of-thumb, handed down from father to son for generations. It has been left to the Americans to devise a number of new mechanical labor-saving implements, which have unquestionably given them a great advantage over the European cutters.

The process of sawing diamonds, for instance, whereby it is possible to saw in two, at the central part, an octahedron or a long stone, or to remove an imperfection that it was impossible to cleave at a given point, has now come largely into use in this country, and has also been carried across the ocean. The invention calls to mind the old method of sawing the larger gems by means of small, flat lead strips, such as were used when the Regent diamond was cut in 1750. At that time thin strips of lead charged with diamond dust were drawn across the stone. The advantage of the new method will be appreciated from the fact that it makes it possible to cut a 6-carat crystal in two, along the best line to place the main table faces of the two stones thus produced. The diamond is held firmly under pressure against a rapidly revolving disk of sheet iron, or "phosphor" bronze. The wheels are much like those used in sawing thin sections for microscopic rock sections, or for cutting jade, rock crystal and other hard stones. It is claimed that in thus dividing an octahedron at the center, as little as two percent of the weight of the crystal is lost—a great saving of material.

More recently certain expert cleavers found that they could remove an occasional part of a diamond, such as the angle of an octahedron, by nicking the stone at a given point, and then by a sharp blow breaking off a piece, saving both the material and the time that would have been lost in removing the edge or piece by polishing.

A patent has also been granted for a new process of grooving diamonds, these gems of course being also polished; and the claim is made that the grooving insures a greater brilliancy. The diamonds are sometimes cut with perfectly parallel grooves around a stone having eight, ten, twelve or eighteen sides. The grooving is also

applied to the facets of the brilliants, especially in the new forms of cutting in which the pavilion of the stone is entirely replaced by rose-cut facets; and the hollows of the concave grooves are as bright as the other faces. A diamond of any shape can be polished by this method.

Attention has also been attracted by a new "dop" that holds the diamond while it is being cut and polished. This instrument grasps the stone in claws and holds it while it is undergoing the polishing process, thus doing away with the need for securing the diamond in place by means of a fusible metal, which requires heating many times in the handling of a single stone, with the attendant risk of injuring the stone by the repeated heating. These "dops" have mechanical devices so arranged that a set of facets can be adjusted and cut on a diamond by a single setting of the diamond in the dop.

#### Automobiles for Polar Explorations.

The latest plan for antarctic exploration is conducted by a Russian named Arctowski—an appellation that sounds like a pun on the work in which he is engaged. M. Arctowski is in fact a member of the scientific staff of the Belgian Antarctic Expedition of 1897-1899, which was the first to winter in the south polar regions. His new scheme was set forth in September at the Congress of Mons, in which King Leopold took such interest; and it involves the systematic exploration of the Antarctic regions by a preliminary circumpolar expedition, which is to leave Antwerp this year with the object of exploring the most unknown sections of the south pole, with the view of finding new lands and suitable places for the establishment of subsequent wintering stations. The most original and interesting part of M. Arctowski's project, however, is his idea of utilizing an automobile, of special construction, to penetrate into the interior of the Antarctic Continent. He thinks that if the experiment were successful, automobiles could be used on the inland ice to transport all the material necessary for the establishment of a far advanced station in the interior, whence further explorations could be made. Scientifically, this station near the south pole would add very much to the data collected by the several expeditions to be sent out in accordance with the plan of the Association of Polar Explorers. The result of this experiment will be watched with keen interest by the world. The balloon has been tried as an agent in polar exploration, and has failed; it remains to be seen whether the automobile will be more successful.

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Tickets, &c. Machine for separating..... W. A. Gibbs  
Tiling..... F. C. Milloff  
Time lock. Electric..... J. T. Van Dillen  
Tire and means securing same in place. Resilient..... W. F. Beasley  
Tire attachment. Wheel..... J. F. Horn  
Tire. Bicycle..... L. W. Groat  
Tire charging valves. Coupling for..... G. W. Kellogg  
Tire plug..... F. B. Parks  
Tire. Pneumatic..... J. H. Bleoo  
Tire. Vehicle..... R. B. Parker  
Tires. Chain armor for pneumatic..... E. B. Hazleton  
Tool. Combination..... E. Hogan  
Tool handle. Pneumatic..... W. H. Keller  
Tool holder and tool..... C. W. Grant  
Torpedo. Automotor..... H. A. Noalhat et al

Toy..... L. E. Bergenster  
Toy elevator..... W. H. Smith  
Toy fire engine..... H. T. Kingsbury  
Toy. Inertia wheel..... 3 pats..... H. T. Kingsbury  
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Toy vehicle wheel..... D. P. Clark  
Toy. Wheeled..... H. N. Parker  
Trace hook..... J. T. Scogin  
Trace splice..... H. Brelding  
Track aligning apparatus..... F. B. Shaw et al  
Traction towing. Gripper mechanism for..... P. Thompson  
Train order holding device..... W. Ayrea  
Trap..... R. L. Springfellow  
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Tree felling footboard..... A. E. Evans et al  
Tree protector..... S. S. Staley et al  
Tripod head..... G. J. Hoelzer  
Trolley contact..... I. J. Bradshaw  
Turbine. Elastic fluid..... 3 pats..... G. Westinghouse  
Turbine. Steam..... J. F. Brady  
Type writer desk..... W. F. Fraser  
Type writers. Paper and envelop feeding attachment for..... S. D. Ruth  
Type writing machine..... M. W. Pool  
Type writing machine carriage bearing..... E. G. Latta  
Type writing machine word registering attachment..... R. R. Fowler  
Type writing. Manifold sheet for..... H. N. Mathews et al  
Umbrella stick and cane..... J. & H. Landes  
Vaginal glass applicator..... M. B. Pearlstein  
Valve and stop valve. Combined throttle..... G. R. Smith  
Valve for train pipes. Steam..... E. E. Gold  
Valve. Reducing..... H. L. Harbaugh  
Vapor used in the destruction of weeds and rabbits. Apparatus for generating..... B. Locking  
Vapors of volatile solvents. Apparatus for recovering..... E. Bouchand-Praceig  
Vehicle brake..... J. Curry  
Vehicle hitching attachment..... J. B. Plato et al  
Vehicle. Motor..... T. Stafford  
Vehicle. Motor propelled..... E. S. Clark  
Vehicles. Egg case carrying attachment for..... R. N. Story  
Vending machine..... F. E. MacCordy  
Vending machine..... A. T. Hallock  
Vessel cap..... 2 pats..... J. M. Hicks  
Vise..... E. Perron et al  
Wad sorting machine..... W. L. Morris  
Wagon body lifter..... J. H. Simonton  
Wagon brake..... E. B. Rose  
Wagon bound..... R. T. Petrich  
Wagon side board..... J. J. Coyle  
Wall covering..... T. Cleary  
Wall coverings. Machine for producing plush effects on..... T. Cleary  
Wall coverings. Manufacture of..... T. Cleary  
Wardrobes. Clothing support for..... L. Gallot  
Wardrobes. Movable support for..... L. Gallot  
Washboller attachment..... S. J. Gibson  
Washing machine..... M. L. Winegarden  
Watches. Cannon pinion for..... L. A. Fallers  
Water bag..... A. C. Eggers  
Water closet and seat therefor..... C. H. Muckenhirn  
Water heater..... R. J. Hutckins  
Water jacket..... C. W. Hawkea  
Water meter..... C. F. Drake  
Water motor..... P. T. Coffield  
Water or impact motor..... B. H. Divine  
Water. Purifying..... 2 pats..... J. F. Wixford  
Water wheel..... A. C. Mather  
Water wheel..... O. H. Nordstrom  
Whiffletree hook..... J. Stahl  
Winding machine..... A. D. Scott  
Windlass. Friction..... W. J. Nelson  
Window fixture..... J. E. Woods  
Window fixture..... W. S. Cooper  
Window screen and guard..... A. Johnston  
Wire cutting device..... J. B. Foote  
Wire fabric..... H. Richardson  
Wire stretcher..... W. A. Steere  
Wire stretcher clamp..... D. H. Parker  
Wood. Apparatus for forcing fluids into..... S. Willner  
Wrench..... E. R. Klemm  
Wrench..... J. H. Shepherd  
Wrench..... H. L. Newton

## DESIGNS.

Badge..... H. W. Tuckey et al  
Bonbon dish..... C. A. Bennett  
Carriage..... C. Kramer  
Coffee pot..... C. A. Bennett  
Fabric. Printed textile. 3 pats..... E. B. Vandergaw  
Gate..... J. H. Wheelock  
Mirror or similar article. Hand..... A. Keller  
Paste jar..... J. A. Larrabee  
Pen holder and tray. Fountain..... M. A. Benziger  
Ring..... A. A. Dorf  
Salt or pepper pot..... C. A. Bennett  
Spoon..... E. F. Rueckert  
Spoon or fork..... C. A. Bennett

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## MECHANICAL PATENTS.

Abdominal appliance..... S. H. Burns  
Accident. Device for preventing..... C. Mathews  
Acetylene generator..... R. F. Carter  
Acid. Manufacture of hydrochloric..... I. L. Roberts  
Acid. Manufacturing nitric..... H. Pauling  
Advertising device..... C. H. Neal  
Alternator. Magneto..... L. J. Le Pontois  
Animal trap..... S. H. Shelley  
Annunciator..... J. & W. Patten  
Asbestos thread and making same..... A. J. & H. A. Foulda  
Automobile driving attachment..... B. A. Gramm  
Automobile tonneaus. Folding foot rest for..... R. A. Leslie  
Automobiles. Valve gear for regulating descending..... H. Saurer  
Axle for grain drills..... F. R. Packham et al  
Axle for motor vehicles. Steering..... T. J. Lindsay



Bag closure ..... J. Rogers  
 Bait receptacle ..... W. Shinn  
 Ball and socket joint for dolls and the like ..... E. Debes  
 Balls. Apparatus for making game ..... A. L. Burt  
 Ballis. Making game. 2 pats. A. L. Burt  
 Ballot box. Registering and canceling ..... E. K. Tolman  
 Barrel closure. Detachable ..... S. J. Sikes  
 Bathing apparatus ..... H. R. Auld  
 Bearing adjuster ..... G. C. Spangler  
 Bed ..... G. F. Fleckenstein et al  
 Bed ..... J. J. Braznell  
 Bed protector ..... M. B. Le Lande  
 Bed slat ..... J. W. Tatum  
 Bedclothes fastener ..... G. A. Allen  
 Bedclothes retainer ..... A. R. Campbell  
 Berry box ..... J. E. Hardman  
 Binder. File ..... C. R. Nelson  
 Binder. Loose leaf ..... G. E. Post  
 Binders, &c. Baffle for the locks of the adjustable backs of loose leaf ..... J. Fieberg  
 Binding post ..... H. E. Reeve  
 Blast furnace ..... E. P. Mathewson  
 Block signal system. Safe ..... C. J. Cronin  
 Boats. Salvage means for submarine ..... E. P. Dougherty  
 Boiler flue fastening ..... L. Eager  
 Book. Manifold blank ..... J. F. Holmes  
 Boring bar ..... C. M. Loyd  
 Bottle. Non refillable ..... F. S. Heffernan  
 Bottle. Non refillable ..... P. J. O'Brien  
 Bottle. Non refillable ..... L. A. Robertson  
 Bottle stopper ..... F. W. & A. Viemeyer  
 Bottle washing machine ..... B. F. Schirmer  
 Bottle wrapper making machine ..... H. Kruse  
 Bottling and like apparatus ..... C. Sellenscheidt  
 Box or crate head ..... A. S. Mann  
 Bracket or track support ..... D. D. Miller  
 Brake beams. Suspension device for metal ..... F. N. Paris  
 Brakes. Automatic cut out for electropneumatic ..... E. H. Dewson  
 Bucket. Clam shell ..... H. P. Horn  
 Building construction. Reissue ..... R. W. King  
 Burial casket ..... W. H. Lawson  
 Button. Collar ..... A. Schwiager  
 Button. Ornamental ..... F. E. Stanley  
 Button sawing machine ..... P. A. Reiser  
 Calsson ..... E. N. Gilbert  
 Calculator. Pocket ..... C. A. Haas  
 Can exhanster and cooker ..... M. W. Groom  
 Canceling and counting apparatus ..... T. A. Br mberry  
 Car brake ..... C. Remelius  
 Car bumper ..... R. H. Fletcher  
 Car coupler. Automatic ..... A. J. Beard  
 Car coupling ..... W. S. Schroeder et al  
 Car coupling ..... S. E. Jackman  
 Car drain and trap. Combined ..... J. C. Carry  
 Car dump and conveyer ..... A. Moore  
 Car dump. Automatic revolving ..... A. Moore  
 Car dump. Revolving ..... A. Moore  
 Car fender ..... E. C. Haynes  
 Car fender ..... F. W. O'Connor  
 Car frames. Post and carline for railway ..... W. F. Kiesel, Jr  
 Car. Railway ..... A. B. Bellows  
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 Car. Steel ..... A. B. Bellows  
 Car underframe construction ..... A. Becker  
 Carbon plate for protective devices ..... G. W. Pickard  
 Carbureter ..... J. H. Mason  
 Card holding case ..... J. B. Wiggins  
 Card or pulp board. Method of and apparatus for the manufacture of ..... H. D. Loria  
 Carriage. Child's ..... W. Diemer  
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 Casket ..... J. H. Mills et al  
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 Chain for gripping and supporting metal blanks ..... H. C. Cunningham et al  
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 Chair seat. Adjustable ..... C. H. Vader  
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 Cheese cutter ..... H. F. Dunn  
 Cheese cutter ..... T. C. Braskett  
 Cherries &c. Machine for stoning ..... H. Creste  
 Chip cutting machine ..... E. Morternd  
 Chuck. Pneumatic ..... H. R. Slivinski  
 Churn ..... J. I. Shaw  
 Cigarette making machine ..... E. Hocq  
 Circuit controlling device ..... G. E. Painter  
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 Coaster brake ..... C. D. Beverly et al  
 Coffee hopper ..... G. W. Phillips  
 Coffee urn ..... R. M. Bamford  
 Coin controlled apparatus ..... C. C. Clawson  
 Coke and gas plant ..... V. G. Apple  
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 Collar distender. Horse ..... F. Mull  
 Collar. Horse ..... J. D. Whipple  
 Commode. Invalid's ..... W. A. Hardy  
 Concrete mixer ..... D. Warner  
 Controller ..... F. Volk  
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 Cotton handling apparatus ..... A. F. Tidwell  
 Cotton. Machine for elevating and feeding seed ..... C. R. Benefield  
 Crane ..... G. E. Soper  
 Crushing rolls. Shell and core for ..... W. G. Bryant  
 Cultivator ..... D. S. Blue et al  
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 Current regulator. Alternating ..... G. Finzi  
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 Directory. Telephone ..... E. N. Lake  
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 Display figures. Limb for ..... I. & V. Kolar  
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 Display rack ..... W. H. Billings  
 Distilling apparatus ..... J. Pernat  
 Dividers and compasses. Combined ..... J. F. Clutter  
 Domestic boiler ..... C. Madeira  
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 Door hanger for slidable doors ..... A. O. & G. E. Banks

Dough cutter and crimper. Combined pie ..... O. J. Coppins  
 Draft equalizer ..... P. Held  
 Drafting instrument ..... R. Marx  
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 Drill scraper. Disk ..... S. E. Davis  
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 Drinking apparatus. Sanitary ..... F. S. Hunter  
 Drip tray ..... H. Ganswindt  
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 Drum. Rope ..... T. S. Miller  
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 Duplicating machines. Stencil sheet attachment device for circular or other ..... J. Eliam  
 Dye Indigo ..... J. W. Fries  
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 Egg testing compartment box ..... I. R. Cole  
 Electric motor control system ..... H. D. James  
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 Electric motor controller. 2 pats. H. D. James  
 Electric novelty ..... P. H. Korst  
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 Electrical distribution system ..... R. M. Palmer  
 Electrolytic deposits. Obtaining marketable ..... P. Steenlet  
 Elevator ..... I. H. Venn  
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 Engine speed adjusting device. Fluid pressure ..... C. Robinson  
 Evaporating apparatus. Vacuum ..... C. Ordway  
 Exercising apparatus ..... C. A. Grabner  
 Exercising device ..... H. J. Bradstreet  
 Explosion motor ..... B. S. Molyneux  
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 Extension bit ..... W. B. McElneve  
 Eye protector ..... E. Mirowitch  
 Fabric holding and stretching frame ..... M. A. Weathers  
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 Fence gate ..... G. J. Baizler  
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 Fence post ..... A. E. Jester  
 Fence post ..... J. A. McDaniel  
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 Fence stretcher. Wire ..... W. M. Dillon  
 Fence tightener ..... E. B. Webster  
 Fertilizer distributor ..... J. D. Williamson  
 Fertilizer distributor ..... S. Robinson  
 File. Bill ..... E. M. Schreimer  
 Filing case. Ticket ..... A. H. Reinhardt  
 Filter ..... J. S. Heaton  
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 Filtering device. Liquid ..... G. Stade  
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 Fire boxes. Circulating device for water ..... S. E. Linsley  
 Fire crackers, &c. Machine for making and finishing ..... L. & J. Schulman  
 Fire extinguisher. Chemical ..... H. Mikorev  
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 Flue sheets and the like. Cutter for ..... J. W. Faessler  
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 Furnace smoke consuming attachment ..... S. P. Hutchinson  
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 Furniture nail ..... S. M. Merrill  
 Fuse plug ..... J. Sachs  
 Game apparatus ..... H. E. Henwood  
 Game apparatus or puzzle ..... I. K. Clouser, Jr  
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 Garment supporter clasp ..... D. L. Smith et al  
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 Golf club ..... J. & D. Foulis  
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 Hide treating apparatus ..... F. B. Hinkson

Hinges. Pintle retainer for ..... B. W. Lewis  
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 Horse controlling device ..... J. Cherry  
 Hose coupling ..... P. Roulstone  
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 Hydrocarbon burner ..... W. E. McConnell  
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 Injector ..... G. W. Mason  
 Inking pad and holder therefor ..... J. F. Ames  
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 Irrigating ditches, &c. Fish screen for ..... F. B. Morse  
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 Joist hangers. Making wrought metal J Craig  
 Knob lock ..... O. C. Call  
 Labels or stickers in fillet form. Automatic machine for feeding, moistening, and cutting ..... J. D. Humphrey  
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 Lamp and lantern holder. W. N. Roberts et al  
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 Lathe. Crank shaft ..... W. H. Lucas  
 Leak stopping gland ..... J. P. Hanson  
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 Lever. Breech block operating ..... G. Gerdorn  
 Life preserver ..... L. L. Smith  
 Lifting jack ..... A. J. Stonecker  
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 Lime. Hydrating ..... C. Ellis  
 Line casting machine ..... F. C. Lucke d'Aix  
 Liquids. Biological purification of ..... W. P. Dunbar  
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 Locomotive fire box ..... J. Nilsson  
 Loom for weaving ..... A. Tcherniack  
 Loom let off mechanism ..... T. A. B. Carver  
 Loom. Narrow ware ..... A. & S. Widmer  
 Loom take up mechanism ..... C. F. Roper  
 Lubricator ..... T. F. Morse  
 Lubricator ..... I. Trotter  
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 Mail crane ..... B. F. Myers  
 Manure sower ..... L. Kniffen  
 Map case ..... E. G. Dann  
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 Measuring instruments. Casing and terminal block for electrical ..... W. M. Bradshaw  
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 Oil applying implement ..... J. T. Earhart  
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 Oil, grease, and the like from oil bearing material. Extracting ..... F. J. Maywald  
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 Ores. Concentrating ..... 6 pats. A. Schwarz  
 Organ ..... E. M. Skinner  
 Ozone producing apparatus ..... W. P. Rice  
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 Packing. Piston ..... W. J. Kane  
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 Padlock ..... 2 pats. F. Soley  
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 Paper fabric. Machine for making reinforced ..... S. E. Mass  
 Paper feeding machine. 2 pats. F. L. Cross  
 Paper machine suction box ..... C. Potter  
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 Paste press ..... C. R. Solivolo  
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 Piano attachment ..... S. D. Egan  
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 Pipe bending machine ..... J. Neuert  
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 Pressure gage ..... W. N. Mitchell  
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 Propeller ..... J. C. Franklin  
 Propeller. Speed controlling reversing ..... C. F. Roper  
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 Pump. Centrifugal ..... G. W. Skinner, Jr  
 Pump. Fluid motive power ..... H. T. Farnsworth  
 Pump rod coupling ..... J. E. Lester  
 Pump. Rotary ..... C. Nobbs  
 Rail bond ..... L. B. Buchanan  
 Rail joint ..... A. E. Calhoun  
 Rail joint ..... A. T. McElhaney  
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 Rail joint construction ..... F. Sherwood  
 Railway and other rolling stock. Buffer coupling for ..... J. T. Jensen  
 Railway appliances. Electric controlling mechanism for ..... W. J. Bell  
 Railway. Electric ..... F. Adams  
 Railway gate ..... G. W. Downey  
 Railway gate ..... J. H. Edwards  
 Railway rail joint ..... J. S. Goodwin  
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## ARIZONA'S PETRIFIED FOREST.

By CHARLES ALMA BYERS.

A PETRIFIED FOREST covering nearly five thousand acres of desert land is one of the unique attractions of Arizona. The trees of this forest of stone, contrary to the possible impression of some persons who have never visited it, do not stand upright as in an ordinary living grave, but instead, all lie prostrated upon the barren soil. The scene is one entirely of death and desolation. The area, with the exception of a few spectre-like mesas of clay and sandstone shale, is almost as level as a floor, and as far as the eye can reach, only these fallen monuments to past ages of vegetation dot this desert expanse. The sizes of these petrifications range from pebbles as small as toy marbles, to logs five and six feet in diameter and a hundred feet long, and all are as hard as adamant.

The forest is located in the eastern part of the territory, scarcely outside the borders of the Painted Desert, and is divided into two sections. The east-



NATURAL WONDERS OF THE SOUTHWEST.

ern division, containing about two thousand acres, is reached by a drive by carriage of eight miles from Adamana, a small station on the Santa Fe railroad, and the western section by a drive of nearly fifteen miles from Holbrook. If the traveler's time is limited so that he has only time to visit one section of the forest, the one reached from Adamana should be given the preference. The other, it is true, is the larger and contains the largest trees, but it is the eastern part that possesses the famous natural bridge and other formations not found in the western portion.

The drive to the forest from Adamana for a distance of about seven miles is uninteresting, for there is naught to view save a limitless plain of dry, sandy and almost entirely barren soil. Presently, however, stray bits of petrified wood, glistening like rare gems under the seldom clouded sun, begin to attract one's attention. Next comes larger ones, and then in a



HUGE LOGS IN THE PETRIFIED FOREST OF ARIZONA.



NATURAL BRIDGE IN THE PETRIFIED FOREST OF ARIZONA.



short while the visitor finds himself in the midst of huge petrified trees. There are logs scattered about in profusion, blocks of all sizes and lengths, shattered limbs and slivers of varied hues. All are as dense as flint, but their resemblance to wood is nevertheless so perfect that until a close examination is made, one can see no reason why a match should not ignite them into flames. There are sections that appear as if decayed, and others that seem, to the eye, to still possess the sap of life. When one picks up a small segment, however, he finds it denser than any ordinary stone and almost as heavy as lead.

It is the inclination of these petrifications to break up by transverse fracture, and often one finds a log nearly a hundred feet in length, broken up into blocks with ends almost as smooth as if sawed. And, although

and limestone, which cover the entire forest, leaving 111 feet of it already exposed. It is not known how much of its length still remains obscured, but each year the action of nature's elements brings more of it into view. The integrity of this natural curiosity has so far been well preserved, but in the last few years transverse cracks, as is customary, have commenced to appear, and fearing that the log might tumble to pieces the government has had two stone abutments placed under it, converting it into a bridge of three spans.

The age to which these petrifications owe their origin, and of what peculiar evolutionary processes they mutely tell us, is unknown; although it is supposed that it dates this side of the mesozoic age. Anyway, their appearance testifies well to their antiquity. The opinion of authorities is that at

now, instead of logs of wood, we find logs of stone—and hence the great petrified forest of Arizona, and the largest and most wonderful of such deposits in the world. The government, manifesting its great interest on this account, has recently declared the area a public reserve, and every year hundreds of people from all parts of the world travel many miles to look upon this forest of stone.

The petrifications of this forest when cut and polished by the lapidary, make very pretty stand and table tops, and are highly prized by those fortunate enough to possess them. At every exposition one sees exhibits of such work, and there are many people who, never having seen the petrifications as they exist on the forest area of Arizona, doubt that the material polished into such a pretty varicolored stand top ever grew as the fibre of pine. He who visits the forest or deposit, however, is convinced beyond all previous skepticism.

#### The Model Home.

Custom has made us familiar with the many devices invented to increase the comfort of our houses. We do not appreciate how fortunate we are until we compare our lot with that of our friends in England and France. We would not tolerate in the meanest houses here, sanitary equipments in daily use in good quarters of Paris. Bathtubs, regarded there as a luxury, are too common here to be discussed. The French fashion of having a copper tub on wheels brought through the streets to one's bedroom when a hot bath is desired, would not appeal to our sense of comfort.

From the cellar up, the modern house is equipped for sanitation and convenience. The furnace is self-regulating; hot water is carried in tubes throughout the house, so as to keep the rooms at an even temperature. The kitchen is floored with a patent composition of pale yellow, warmer than tiles, although equally non-absorbent and easy to clean. A six foot wainscoting of tiles joins the glossy plaster above without a break, the ceiling being finished with a curve. There are no projections, no angles not readily dusted out with a cloth. The room may be kept clean with a minimum amount of labor.

The range has a wide iron hood, catching the odors and heated air, and drawing them up through a register into the chimney. It has also a gas attachment, arranged over the range proper and including an oven, a boiler and extended top. It is convenient in summer, and can be used at the same time as the coal range if more capacity is needed. The cooking utensils are of aluminium. A revolving grate disposes of all clinkers and ashes. The old-time cook with her ineffective little poker would look at these with awe and amazement. Cooking by electricity will soon become common; already, electric plate warmers and various small devices are in use.

The storeroom has non-absorbent shelves graduated in width according to the articles to be kept on them, with

flour and sugar in metal bins which tip back or slide in, or in other ways are cleverly contrived to fit the space allotted to them. Ice is placed, from without, into a receptacle within the double walls.

The inventions employed in the laundry would fill a volume with description. Some of them, of course, are not suitable for use in private houses; but the line of porcelain tubs, supplied with hot and cold water, and the convenient wringer, seem so much a matter of course that we forget the amount of lifting a woman was obliged to do in the days of portable tubs. At the side is a drying room, with rows of movable racks, easily pulled out and filled with clothes and then rolled back into the hot, dry air of the steam chamber.

A very simple form of steam washer, which cleans the clothes perfectly without rubbing, is used in the boiler. This is sometimes an elaborate affair in larger laundries, but the principle is the same—a current of steam and hot water constantly passing through the meshes, removing all stains.

An electric iron, a heavy affair connected by a covered wire with the nearest electric fixture, is used for ironing fine pieces. A mangle for straight coarse goods takes the folded sheets or towels rapidly between heated rollers.

From the first floor of the house, an elevator is provided for the use of persons unable to climb the stairs. This is run by electric power. By a push button on a dial inside, the car is started, when both doors are closed. The elevator stops automatically when it reaches the desired floor. The doors cannot be opened until that floor is reached, thus preventing possible accidents. An attendant is not needed for this elevator. It can be opened only when opposite a floor, and it will not start until both doors are locked. Often a smaller lift is provided for freight, such as coal or linen.

For increasing the light at the end of long rooms, there are many devices. The commonest diverts the light through prisms of molded glass until the rays enter the room horizontally. Window cleaning, also, has been simplified, as windows may be arranged to swing on a pivot into a room as well as up and down.

The luxurious fittings of the modern bath room, with its tiling and open plumbing, are known everywhere; but the hospital room is less common. In many houses, especially where there are children, a room is fitted up on the top floor, isolated from the rest of the house, for use in cases of sickness. The walls are painted in a cheerful color; the floor is covered with some patent preparation like lignolette or asbestolette. A tiny but complete arrangement for cooking the invalid's food is connected with the chimney, which carries off all odors. It is here that the electric equipment for cooking and sterilizing food finds its true value.

THE INVENTIVE AGE contains sound advice to inventors and patentees. For lack of such advice many have lost money. Subscription, one dollar a year.



PETRIFIED SENTINEL OF THE MESA.

these segments are petrifications of only one kind of timber—pine—and often of one tree, there are representations of nearly every conceivable color. Among them are black, red, white, yellow, blue, purple, and lavender; and the mineralogist, analyzing these fragments, finds in them chalcedony, topaz, carnelian, onyx, agate and amethyst. That there are representations of so many different substances is thought to be due to the state of the tree's preservation at the time of its petrification, and to the stage of compactness it reached prior to being unearthed from its bed of shale.

The famous natural bridge of this forest is formed by a large petrified tree trunk spanning an *arroyo seco*, or dry ravine, fifty feet wide. It is a bridge of agate and jasper overhanging the only clump of living trees within the forest's borders. Each end of this log is still embedded in the shale

sometime in the distant past this area was covered by a forest of stately pines. Years passed, and then probably an inland sea spread over the forest region. The depression for this sea may have been caused by an earthquake, although such is not known. At least the forest was felled to the ground, and over their prostrated trunks, and probably after the inland sea had vanished, volcano craters belched forth a chemical spume, to serve as a mantle for the deceased pines and the vanished ocean's bed. The forest of other days reposed in oblivion. No monuments marked or dotted its graves. But time went on, and nature came slowly to its rescue. Erosion began its work, and after centuries of slow, steady labor it has accomplished much of its task of resurrection. But how changed is the forest! As it reposed under its volcano-made blanket, nature's sybaritic chemistry had also been at work, and

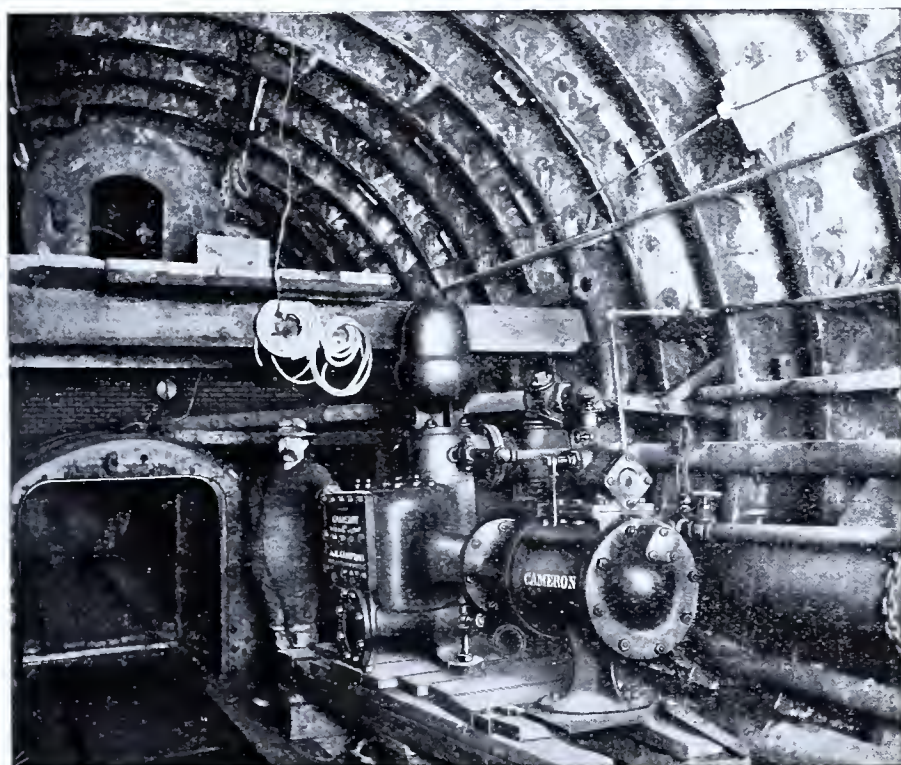


## THE DRAINAGE OF THE EAST RIVER TUNNEL.

By W. I. AIMS, M. E.

THE expenditure of millions of dollars in Greater New York in subways and tunnel work is attracting considerable attention, owing to the difficult engineering problems encountered and sub-surface tunneling methods employed by the various contracting firms who are executing the work.

Through the courtesy of the *Railway Critic* we are able to produce the accompanying illustration which shows a photographic view of the Brooklyn and Manhattan Tunnel Pumping Station, situated on the Brooklyn side of the tunnel. The tunnel is now in the course of construction under the East river, the Brooklyn shaft being at Furman and Joralemon streets, and will connect the Brooklyn Subway with the Interborough Rapid Transit Subway, at the southern end of Manhattan Island in Battery Park.



Soon after ground was broken for the tunnel, it was necessary to install a pumping plant to provide for the disposition of water, and the accompanying illustration shows a Cameron regular pattern piston station pump, 14 inches by 10 1/3 inches by 18 inches, of the light service type, in position in the tunnel, about 100 feet from the Brooklyn shaft.

By careful observation on the left hand side of the view, the reader will notice a bulkhead, consisting of a solid brick wall built across the entire tunnel. This wall is built entirely of brick, being three feet thick and heavily braced with timbers, and forms a compressed air chamber situated on the further side of the bulkhead, where the air pressure is maintained at twenty pounds per square inch. The tunnel is being driven by the "pneumatic shield" method.

The entrance into the workings of the tunnel is accomplished through two air locks, which are also shown in the view. The lower air lock, which is 6 feet 6 inches in diameter, is used for the exit of material, which is re-

moved by cars on a trackway. The upper air lock is an emergency lock for use by the men in escaping in case of the flooding of the tunnel.

The accumulation of water in the excavation is forced out of the air chamber by means of the air pressure through a pipe built within the bulkhead, the water thus falling to a pump outside of the wall, from which it is pumped to the surface, the lift being 60 feet.

Owing to the water being very dirty and gritty, the water cylinder of this pump is supplied with a removable iron bushing. The pump is operated by compressed air, the exhaust of which is delivered into the compressed air chamber of the tunnel, where it is again utilized.

The Cameron pumps are especially adapted for this work, being compact and strongly built, having few working parts, and no outside valve gear

nor rods to become broken or to get out of alignment. The construction of their operative mechanism is such as to give equal efficiency with compressed air or with steam.

Over a score of Cameron horizontal plunger and piston pumps are in service at various parts of the tunnel; in fact, over 100 are solving the unwatering problems in numerous parts of New York's subways and tunnels.

### A Real Fireproof Building.

"The new Security Building, in Bridgeport, Conn., which is nearing completion, is attracting much attention from engineers and insurance men for the reason that it will be devoid of wood absolutely," says *The Record and Guide*: "It will not contain a piece of wood as large as a match when completed, and therefore will be absolutely fireproof. In one other particular it is unique for the reason that it will not possess one solitary piece of stone in its natural form. The staircases are of the winding order and made of concrete. The building is constructed on the cantilever plan, and it is supported by foundations of unusual strength. The walls are of concrete, and throughout the whole building no wall is thicker than eight inches. The floors are made of a composition which is fireproof, and the doors, window sills and frames are of metal."

## HOPE FOR THE LAZY MAN.

By B. G. FOSTER.

A patent has just been granted on an antitoxin for fatigue, and on the process of manufacturing the same. What varied feelings are aroused and thoughts awakened by the announcement! Hereafter there is to be no fatigue, no tired feeling, no use or necessity for recreation, amusement, rest or change. The indolent and lazy will disappear. There will be no such thing as overwork. The laboring man will be inexcusable if he strikes for shorter hours and his only regret can be that there are but twenty-four in a day. The professional man's brain, unwearied, can now toil unceasingly, and floods of literature from the tireless hands and pens of our writers will engulf the world, already well-nigh swamped with trash. The sleep-for-saken criminal need no longer have the pinched, haggard visage, to which he is presumed to be addicted, but his cheeks can glow with the blush of rested health. And all because

"Sleep, that knits up the ravell'd sleeve of care,  
"The death of each day's life, sore labour's bath,  
"Balm of hurt minds, great nature's second course,  
"Chief nourisher in life's feast."—

is to be unnecessary and become a thing of the past. All walks of life, all sorts and conditions of men, like Tennyson's brook, can now go on forever.

All this is to be brought about by the new anti-toxin. With a hottle of this liquified sleep, and a syringe to inject it into the system, happiness will be almost complete. The only regret is that the new substance does not combine with it food, and clothing; but perfection should not be expected at once. The new invention is unquestionably a long step in the right direction.

An explanation of the invention can best be given in the patentee's own words.

Be it known that I, Wolfgang Weichardt, doctor of medicine, a subject of the German Emperor, residing at Berlin, Germany, have invented an Antitoxin for Fatigue and Process of Making the Same, of which the following is a specification.

I have discovered as a result of numerous experiments that fatigue of the human and animal body (not being exhaustion) is produced by certain toxic substances which are hardly traceable in the normal (unfatigued) organism, but which are always and in considerable quantity found in the fatigued organism. Their existence may be proved by means of experiments, for it was found that animals injected with sterile muscle plasm taken from strongly-fatigued animals of the same kind, became tired or sleepy and that they died after a period of twenty or forty hours: while animals treated in the same manner with the same quantity of muscle plasm from unfatigued animals did not become tired and remained alive. These toxins of fatigue, like all poisons produced directly from the living protoplasm,

cannot be accurately characterized by their chemical composition. They will not pass through an ordinary dialyzer, which is probably due to their large molecular structure. They will not resist heating, and become inactive after two hours when heated to only 56° centigrade. The toxins of fatigue are saturated or rendered harmless by antitoxins produced in the organs of the body when at rest, chiefly during normal sleep. In the blood, which is the vehicle of the antitoxin, an appreciable quantity of toxins of fatigue is only found in cases of extreme fatigue.

My process consists in the production of compounds or pharmaceutical preparations which contain the antitoxins mentioned above, and consequently have the effect, when introduced into the fatigued body or human organism, to make the same recover its normal condition in a comparatively short time without requiring any sleep. For this purpose muscular fatigue is induced in horses or other suitable animals, preferably up to the commencement of yawning fits or spasms, after which they are bled to deprive the muscles of blood, the muscles are cut out, while taking rigid aseptic precautions, after which they are maintained at a temperature of about 37° centigrade for several hours, then pounded in a sterilized mortar. Then the muscle pulp thus obtained is pressed and relieved of superfluous liquid in a press which had been previously sterilized. Suitable liquids, such as blood serum or a physiological solution of table-salt, may be added to, and mixed with, the muscle paste before it is pressed. Instead of muscle plasm, blood plasm, or plasm from other organs, or excretions or secretions of the fatigued animals, such as their milk, may be used, inasmuch as the said organs or products likewise contain the toxin. The plasm thus obtained is filtered through earthenware filters and injected into small animals, such as guinea pigs or mice, to test it as regards the quantity of toxins of fatigue contained in the plasm. If the quantity is found sufficient, the plasm is repeatedly injected into suitable animals—such as rabbits, goats, and horses—for obtaining the antitoxin. After a short time the materials constituting the organs of the animals thus treated or the products of the same, such as their milk, and especially the blood serum, which is comparatively rich in antitoxins adapted to rapidly neutralize or render harmless the toxins of fatigue, are suitable for use in an appropriate form by introducing them into the alimentary circulation of the human body—for instance, as an injecting liquid, or (because the antitoxins pass the stomach and intestines without decomposition) as an addition to enemas, or as an admixture to articles of food or stimulants, or in the shape of pills, tabloids, or similar preparations.

The antitoxin, which like the toxin cannot be accurately characterized by its chemical composition, is less subject to change than the toxin. For instance, it penetrates through the walls of the stomach without experiencing any material reduction of its efficiency.

As mentioned before, the blood is the seat of the antitoxins and normally possesses a certain quantity of antitoxins which are capable of saturating the toxins of fatigue. Consequently the process may be modified by using blood serum or plasm obtained from unfatigued animals directly, for neutralizing or rendering harmless the toxins of fatigue.

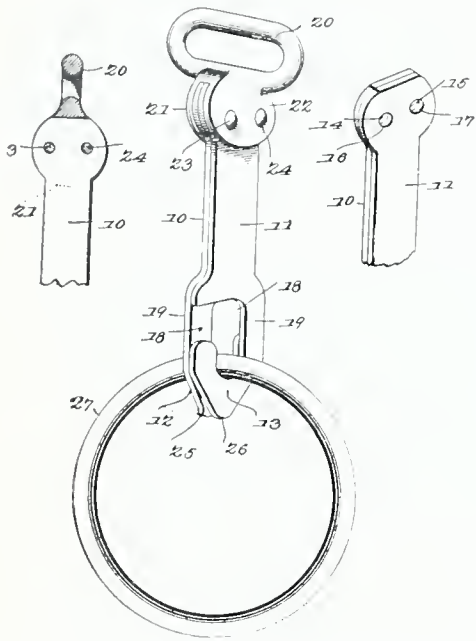


## CLEVER NEW PATENTS.

Snap Hook.—Stirrup.—Clothes Pin Basket.—Plow.—Saw.

### Snap Hook.

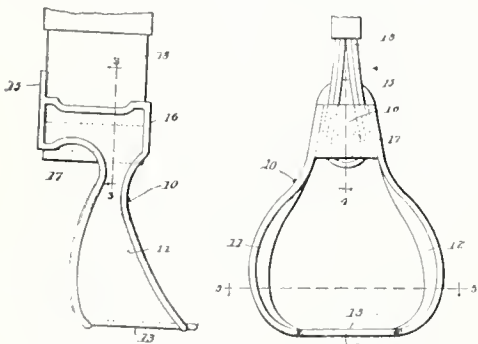
Notwithstanding the multitudinous forms of snap hooks already produced, Messrs. William R. Lapsley and Walter S. Sallee, of McAfee, Ky., have jointly invented and patented a device of this character having certain advantageous features of novelty. The snap hook comprises two resilient plates 10 and 11 of like contour, each provided at one end with a hook, 12-13. The plates from the hooks are



flat throughout their entire extent. A strap-engaging loop 20 is employed, having integral ears 22, between which one end of each plate is disposed, and a plurality of rivets passing through the ears and through the ends of the plates, thereby prevent any rocking movement between the hook and loop. By this means a very simple-constructed and durable "snap" is produced, which may be cheaply constructed and employed effectually wherever devices of this character are required.

### Stirrup.

A new stirrup of novel form, and from which decided advantages are claimed, has been devised by Mr. Frederick W. Bantz, of Dallas, Texas. It comprises spaced curving sides 11-12 connected at their lower ends by a tread 13 having a central depression 14. The sides incline inwardly from front to rear. The side plates are connected by transverse front and rear

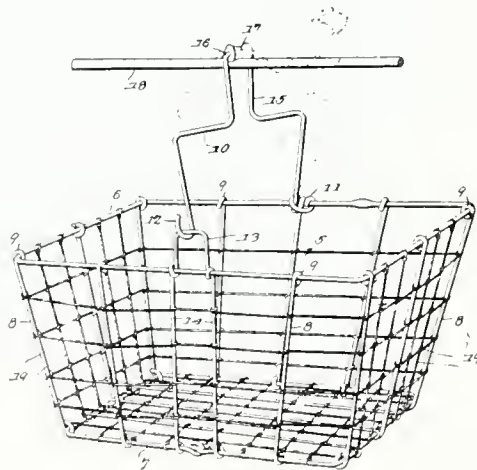


plates 15-16, and a hollow strap bar 17 extends between the front and rear plates. The front plate has an upward extension to form a strap-engaging stop. The converging sides of the frame confine the foot of the rider and prevent it from being thrust into the frame beyond a certain predetermined

distance, thus accomplishing two important results—namely, effectually preventing the foot from "hanging" in the stirrup in event of the rider being thrown from the horse, and likewise preventing the shin of the rider from coming in contact with the stirrup-leather and rubbing the same. The depression 14 in the tread 13 is also an important feature of the invention, as the heel of the rider enters this depression, and the foot is thereby held from lateral movement and maintains the pressure at the center of the tread portion. It will be noted that the bar 17 holds the strap 18 in position without twisting the latter, which is an important advantage, as will be obvious.

### Clothes Pin Basket.

A clothes pin holder has been patented by Mr. Samuel W. Hurlburt, of Creston, Iowa, and Mr. Lansing W. Hurlburt, of the same place, has secured a one half interest in the patent. The object in view is the provision of a basket or holder, which may be readily suspended from, and adjusted on, the clothes line, so as to facilitate the suspending and detaching of the clothes. The structure and arrangement will be clearly apparent by reference to the accompanying illustration, wherein 18 designates a portion of an ordinary clothes line. The clothes pin holder may be of any suitable form, as for instance, a basket 8, and pivoted to one side of the same is a bail 10, having an upstanding looped portion 15 carrying a roller 17 that is arranged to run upon the line. The free end of the bail is in the form of a hook 12 that detachably engages a

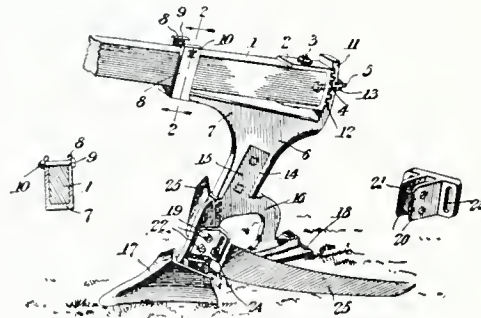


yoke 13, carried by the basket. By this means, it will be seen that the basket can be suspended on the line and moved along the same, so that as the clothes pins are needed or removed, they are conveniently accessible or can be placed in the basket, thus avoiding the necessity of stooping over, and eliminating the liability of losing the pins.

### Plow.

A patent has been recently granted to Mr. Edward Bradford James, of Thomasville, Ga., on a plow that is adaptable for a variety of uses and under different conditions. A beam 1 is employed having a bolt 5, connected with and extending rearwardly therefrom. A standard 6 has an upwardly extending portion 11 adjustably engaged by the bolt 5, and a fulcrum or locking engagement 8 is

formed between the front upper end of the standard and the beam. The foot of the plow is provided with a saddle having lugs spaced from the edges thereof, the saddle engaging the foot, and being provided with vertical slots

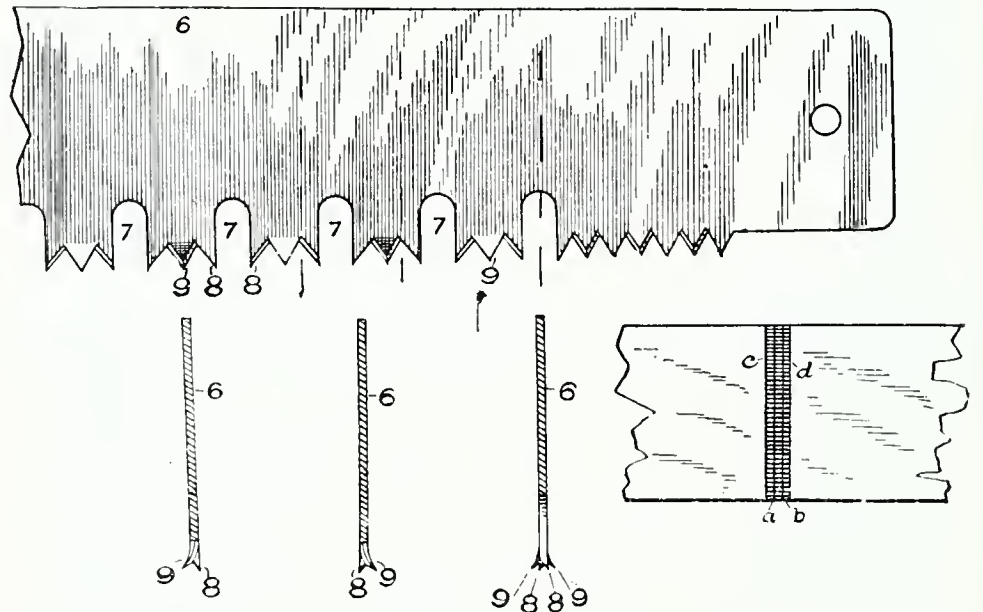


Means are provided for connecting the saddle lugs with the plow foot, and a sweep has connection with the saddle, said connection engaging in the vertical

slots thereof. A bifurcated foot is connected with the standard, and a bolt or pin connects the spacing-block pivotally with the plow-foot. A substantially L-shaped heel frame engages a recess in the spacing-block having pivotal connection with the pin or bolt, said heel-frame being provided with a vertical resilient member having a slot engaging the bolt which projects rearwardly from the plow-beam. It is obvious that this heel-frame may be set at various inclinations or angles, and it will also be seen that by detaching the nut it may be swung out of the way, thus affording access to other parts of the plow which may require to be adjusted. This improved plow is simple in construction, and is practically useful for a variety of purposes. The parts of the device are largely interchangeable.

### Saw.

John Guedel, of Indianapolis, Ind., has secured a patent on a saw, which can be filed with ease and certainty, that will cut through the grain of the wood crosswise, lengthwise, or angling, and which will saw through knots and tangled grain and can be used in hard or soft wood for ripping, cross-cutting, or mitering.



The object of this invention is to provide rake teeth which will make two intermediate cuts in the kerf instead of a single middle one, in order that the fiber which is to be removed in making the kerf will be in a looser and easier-handled condition than where only a single center cut is made.

A further object of this invention is to provide a saw in which the corresponding rake teeth are situated in alternate groups instead of each successive group, thereby by the new arrangement affording a sufficient distance between the corresponding teeth to permit the following tooth to secure the necessary "bite" in the wood to make the saw effective. As shown in the accompanying illustrations, the saw is provided with teeth arranged in groups separated by deep gullets 7. These groups, except at the ends of the saw blade, each consist of three teeth, the outer teeth having straight square outer edges, and inner inclined edges, the latter of which are sharpened on the same side of the blade, the teeth of adjacent groups being filed from opposite sides to form opposite rows of cutting points. The central tooth 9 in each group is triangular and is sharpened on the opposite side of the blade from that of the other two teeth of the group, said cutting teeth being swaged towards the cutting edges. The cutting teeth will cut the fiber of the wood at the outer edges of the kerf, while the oppositely filed rake-teeth will make two distinct cuts intermediate of the outside cut. These inside cuts are shown by the lines a and b, and the outside cuts are shown by the lines c and d. This cuts the fiber of the wood to be removed in making the kerf into three lengths, which makes the fiber easier to break out and remove, as it is in shorter pieces and not so liable to pack.

## PATENTS, CAVEATS, TRADE-MARKS, COPYRIGHTS, AND DESIGNS. TWENTY-FIVE YEARS PRACTICE

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## LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

### CAZIER v. MACKIE-LOVEJOY MFG. CO. et al.

(Circuit Court of Appeals, Seventh Circuit.  
138 F. R. p. 654.)

#### 1. PATENTS—INFRINGEMENT—SUBSTITUTION OF PARTS.

Where the real invention covered by a patent lies in one element of a combination, the others being old, and material only in putting into use that which is new, one who appropriates such novel feature cannot avoid infringement by substituting a different form of one of the nonessential parts.

#### 2. SAME—TROUSERS-HANGER.

The Cazier patent, No. 696,940, for a trousers-hanger having the clamping-jaws of spring metal arched so as to engage the fabric near the ends and stretch the same in closing together, discloses invention in such feature, and is valid. Claim 5, also, held infringed.

### MARCONI WIRELESS TELEGRAPH CO. OF AMERICA v. DE FOREST WIRELESS TELEGRAPH CO.

(Circuit Court, S. D. New York. 138 F. R.  
p. 657.)

#### PATENTS—INFRINGEMENT—WIRELESS TELE- GRAPHIC APPARATUS.

The Marconi reissued patent, No. 11,913 (original No. 586,195), for improvements in transmitting electrical impulses and signals, and in apparatus therefor, while for a combination of elements all of which were taken from the prior art, discloses the first practical wireless telegraphic system, and snows invention of a primary character, which entitles it to a broad construction and a liberal range of equivalents. As so construed, it is not limited to receiving conductors wholly insulated from the earth at both their upper and lower ends, nor to the suspended plates described, but covers also conductors consisting of aerial wires having an earth connection at the bottom. Claim 1 of the reissue in attempting to claim broadly every form of imperfect contact device in the receiver, goes beyond the original patent, and cannot be sustained, in view of the prior art. Claims 3 and 5 held infringed by the apparatus of the De Forest and Snythe patents, which covers an equivalent, imperfect contact device. Claims 8, 10, and 24 held not infringed.

### CAPEWELL v. GOLDSMITH et al.

(Circuit Court, S. D. New York. 138 F. R.  
p. 682.)

#### PATENTS—INVENTION—STICK PIN RETAINER.

The Capewell patent, No. 630,972, for a stick pin retainer, is void for lack of patentable invention, the same device in principle and mode of operation having long been used for analogous purposes, and its adaptation by the patentee to a similar use requiring only mechanical skill.

### DIAMOND DRILL & MACHINE CO. v. KELLEY BROS. & SPIELMAN.

(Circuit Court, E. D. Pennsylvania. 138  
F. R. p. 833.)

#### 1. PATENTS—INFRINGEMENT—ACTIONS—BILL OF REVIEW—NEWLY DISCOVERED EVIDENCE.

In a suit for infringement of a patented belt fastener, newly discovered evidence of a witness, corroborated by two others, that he had made and used a belt fastener, the exact counterpart of that patented, some four years prior to the application for the patent relied on, and that his use was persisted in intermittently for two or three years, was sufficiently material to reopen the case and allow the filing of a supplemental bill in the nature of a bill of review, though no sample of such prior fastening was produced, and it was not regarded as of sufficient merit to induce the witness to continue its use.

#### 2. SAME—DILIGENCE.

Where defendants had been in conversation with a witness from whom they proposed to obtain newly discovered evidence establishing a prior use of a patented device as a defense to a suit for infringement, but claimed that such witness had been only sought out in order to learn about a certain bed spring, and, except as he volunteered information, there was no means of knowing that he had any information with reference to such prior use which he did not

then disclose, this evidence will not be regarded as accessible to the defendants by the exercise of due diligence.

### HURLWOOD MFG. CO. v. WOOD.

(Circuit Court, D. Connecticut. 138 F. R.  
p. 834.)

#### 1. PATENTS—SUIT AGAINST PATENTEE FOR INFRINGEMENT—ESTOPPEL.

In a suit for infringement by an assignee of a patent against the patentee, the defendant is estopped to insist upon a narrow construction of the patent which would render it valueless.

#### 2. SAME—INFRINGEMENT—SCREW DRIVER.

The Wood patent, No. 671,039, for a screw-driver, held infringed on a motion for a preliminary injunction.

### VIRGINIA HOT SPRINGS CO. v. HEGEMAN & CO.

(Circuit Court, S. D. New York. 138 F. R.  
p. 855.)

#### TRADE-MARKS AND TRADE-NAMES—UNLAW- FUL COMPETITION.

Complainant and R. purchased parts of a tract of land containing springs which since 1845 had been known as "Healing Springs." R. named his springs the "Rubio Healing Springs," and sold the water under the name "Rubio Healing Springs Natural Lithia Water," while complainant's water was sold under the label, "Healing Springs. A Table & Medicinal Water," etc., until after R. began successfully to market his waters, when plaintiff imitated R's labels by dropping the words "A Delicious Table Water," and using the words "Urie Acid Solvent," suggested by R's labels, containing the words "Eliminates uric acid." Up to the time R's labels appeared, complainant had said nothing in its labels of Healing Springs, Va., used in R's labels, except: "Healing Springs. A Table & Medicinal Water. From the Great Thermal Region of the Appalachian Ranges"—and ending its label with the words, "For sale by leading druggists in the United States, or can be ordered direct from the Virginia Hot Springs Company, Hot Springs, Bath Co., Virginia," after which complainant changed its labels, and added the words, "Healing Springs, Bath County, Va." It also appeared that all of the springs were at a place having a post office known as "Healing Springs." Held, that R's labels so clearly differentiated the waters sold by him from those marketed by complainant that he was not guilty of unlawful competition.

### LOEW SUPPLY & MFG. CO. v. FRED MILLER BREWING CO.

(Circuit Court of Appeals, Seventh Circuit.  
138 F. R. p. 886.)

#### 1. PATENTS—CONSTRUCTION OF CLAIMS— NEW COMBINATION OF OLD ELEMENTS.

One who selects and combines elements from the inventions of others into a new structure adapted to accomplish the old result is entitled to a patent only for his own particular form of adaptation.

#### 2. SAME—INFRINGEMENT—MACHINE FOR WASHING BOTTLES.

The Cobb patent, No. 690,563, for a bottle-washing machine, covers a new combination of devices known in the prior art, and is limited to the specific adaptation of such parts shown. As so construed, it is not infringed by the machine of the Volz patent, No. 736,037.

### DONCHIAN v. KINGSTON et al.

(Circuit Court, D. Massachusetts. 138 F. R.  
p. 890.)

#### PATENTS—INFRINGEMENT—CARPET FASTENER.

The Donchian patent, No. 541,320, for a carpet fastener, consisting of two sections, one to be attached to the carpet, and having a projecting stud, and one to be fastened to the floor, and provided with a central opening, is limited by the language of its claim and by the construction given it by the patentee when before the Patent Office, to a structure having two distinct and material features, namely, a base section shaped to snugly fit the concaved under surface of the upper section, and a central opening in the base section, the walls of which fit closely about the stud at both its ends to give a compact, solid, and firm union between the two. As so construed, held not infringed by a structure in which the two sections are loosely connected to permit the upper to rock freely upon the lower section.

### VIRGIL PRACTICE CLAVIER CO. v. VIRGIL.

(Circuit Court, S. D. New York. 138 F. R. p.  
897.)

#### PATENTS—INFRINGEMENT—INSTRUMENT FOR TEACHING PIANO PLAYING.

The Virgil patents, Nos. 344,462, 344,464,

391,439 and 479,339, relating to an instrument for teaching the playing of the piano, in which non-musical sounds are substituted for the musical tones of the piano, and to improvements thereon, disclose patentable invention and are valid. Also held infringed.

### REVERÉ RUBBER CO. v. CONSOLI- DATED HOOF PAD CO.

(Circuit Court, S. D. New York. 138 F. R.  
p. 899.)

#### 1. PATENTS—INVENTION AND INFRINGEMENT —HOOF-PADS.

The Kent patent, No. 646,148, for a hoof-pad intended for use between a horse's hoof and the shoe, and having a ventilating part or chamber in the center, was not anticipated, and discloses invention, and is not invalid for prior public use. Claims 1, 2, 5, and 6 also held infringed.

#### 2. SAME—EVIDENCE OF INVENTION—SUC- CESS OF ARTICLE.

The commercial success and success in actual use of a patented article is evidence of a patentable invention.

### PETTIBONE, MULLIKEN & CO. v. VERONA TOOL WORKS.

(Circuit Court, W. D. Pennsylvania. 138 F.  
R. p. 909.)

#### PATENTS—VALIDITY AND INFRINGEMENT— RAIL BENDER.

The Storm patent, No. 344,793, for a rail bender, used by track hands for bending railroad rails, adds nothing to a device previously in use, except its equipment with rollers to grasp the rail, and by means of which the machine may be moved along to successive positions without releasing the pressure by which it holds the rail, and is entitled to only a narrow construction, restricting it to the particular mechanism shown. Claim 1 is void, as too broad, in view of the prior art. Claim 6 held not infringed.

### BRADLEY v. ECCLES.

(Circuit Court, N. D. New York. 138 F. R.  
p. 911.)

#### 1. PATENTS—VALIDITY—PRIOR PUBLIC USE.

Under Rev. St. § 4886 [U. S. Comp. St. 1901, p. 3352], the public use of an invention for more than two years before the application for a patent therefor, although in but a single instance, will defeat the right to a patent.

#### 2. SAME—PUBLIC OR EXPERIMENTAL USE.

If an inventor passes his invention into the hands of different persons to use and test as to the usefulness of the device before application for a patent, such use by them must be restricted to experimental use; and if they are permitted to use the device publicly as a non-patented article, and it is either sold or given away to even a few persons, their use of it will be a prior public use which may deprive the inventor of his right to a patent.

#### 3. SAME—THILL-COUPLING.

The Hannan reissued patent, No. 11,260 (original No. 456,117), for improvements in thill-couplings, while it discloses patentable invention, is void for prior public use; it being shown to the satisfaction of the court, beyond a reasonable doubt, that the inventor either knowingly and intentionally or negligently permitted the public use of the invention for more than two years prior to his application for a patent.

### BRADLEY v. ECCLES.

(Circuit Court, N. D. New York. 138 F. R.  
p. 916.)

#### PATENTS—INVENTION—THILL COUPLING.

The Bradley patent, No. 485,856, for a thill coupling, consisting of a spherical knuckle on the end of the thill iron, and a draft eye composed of two parts, one rigid and one movable, hinged together at the front end, and having a spherical cavity in which the knuckle fits, was not anticipated, and discloses invention. Claims 1 and 2 also held infringed.

### MILLER & ENGLAND v. WALKER PAT- ENT PIVOTED BIN CO.

(Circuit Court, E. D. Pennsylvania. 138 F.  
R. p. 919.)

#### 1. PATENTS—ANTICIPATION—REJECTED AP- PLICATION FOR PATENT.

While a rejected application for a patent is not a bar to a subsequent patent to another for the same device, the fact of such rejection does not of itself characterize the invention as an abandoned experiment, and if it, in fact, had passed beyond the experimental stage and was in practical and successful use, it cannot thereafter be appropriated and patented by another.

#### 2. SAME—TILTING BINS.

The Bacon patent, No. 447,532, for a tilting bin, is void, the bin shown having been previously made and put into use by another.

### MISSISSIPPI GLASS CO. v. FRANZEN.

(Circuit Court, W. D. Pennsylvania. 138 F.  
R. p. 924.)

#### PATENTS—ASSIGNMENT—INVENTION OF EM- PLOYEE.

Where a patent was applied for after the termination of an employment under a contract providing that the employee would execute any and all assignments in writing which might be deemed by the employer proper and necessary to transfer and vest in it the entire right, title, and interest to all inventions and discoveries made by the employee during the term of his employment, the patent vested in the employee, and the burden was on the employer to show by the weight of proof that the invention covered thereby was made by the employee during his employment.

### WESSEL et al. v. UNITED MATTRESS MACH. CO.

(Circuit Court of Appeals, Sixth Circuit.  
139 F. R. p. 11.)

#### 1. PATENTS—INFRINGEMENT—IMPROVEMENTS.

It is the well-settled rule that, where two inventors improve an old machine, each is entitled to the benefit of his own improvement, so long as it differs from that of the other, and does not include his.

#### 2. SAME—MATTRESS—STUFFING MACHINE.

The Stephenson patent, No. 399,093, for improvements in mattress-stuffing machines, with respect to the means employed for adjusting vertically the cover of the press box and spout, in adapting them to different sizes of mattresses, must be limited to the means specified, or its equivalent, and cannot be broadly construed to cover any means for accomplishing the same result. As so construed held not infringed.

### DUFF v. GILLILAND et al.

(Circuit Court of Appeals, Third Circuit.  
139 F. R. p. 16.)

#### 1. PATENTS—CONTRACT OF ASSIGNMENT— GROUNDS FOR CANCELLATION.

A contract assigned the legal title to a patent for a gas producer to a trustee for the benefit of a company, in consideration of the payment by the assignee of one-third of all royalties received from licensees. The company subsequently engaged in the building of the producers itself, granting licenses to those to whom they were sold. The contract contained no provision respecting such building operations, which were not at that time contemplated, but the patentee was fully advised of the company's action, and from time to time expressed his approval thereof. Held, that, while such operations were outside of the contract, he was estopped by his acquiescence from claiming that they were in violation of it and entitled him to its cancellation, or from claiming a share of the profits of such business.

#### 2. SAME—TRUST—EQUITY JURISDICTION.

Such contract required the company to keep accounts showing the licenses granted, which should be subject to the inspection of the patentee, and to account at stated periods for his share of the license fees received. Held, that the conveyance of the legal title to the patent on such conditions created a trust in both the trustee and the company in favor of the patentee in respect to one-third of the license fees collected, which a court of equity had jurisdiction to enforce, and that a bill alleging fraud in failing to account for fees, and in failing to charge the same to the company on sales made to customers which included licensees, and that the company refused to allow an inspection of its books, stated a cause of action for equitable relief.

### STANDARD ELEVATOR INTERLOCK CO. v. RAMSAY et al.

(Circuit Court, E. D. Pennsylvania. 139 F.  
R. p. 28.)

#### PATENTS—PRIOR USE—LOCKING DEVICE FOR ELEVATORS.

The Muckle & Teamer patent, No. 555,825, for a locking device for passenger elevators, claims 1 and 2, are void, being so broad as to include a device previously in use by others, and on which that of the patent is an improvement.

### MARLIN FIREARMS CO. v. KELLOGG.

(Circuit Court, D. Connecticut. 139 F. R. p.  
31.)

#### PATENTS—INFRINGEMENT—BREECH-LOADING GUNS.

The Hepburn patents, Nos. 400,670 and 434,062, each for a breech-loading gun, construed, and held not infringed as to claim 1, and 5 of the former, and 10, 11, 12, and 21 of the latter, and infringed as to claim 27 of the latter.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured  
through the Patent Soliciting Office  
of E. G. Siggers, Patent Lawyer,  
Washington, D. C.

John M. Stuart, Elmo, Texas. Valve Operating Mechanism for Baling Presses. Two patents.—The two patents issued to Mr. Stuart are quite broad, and cover an automatic valve mechanism whereby the operation of a fluid operated baling or packing mechanism will be regulated in accordance with the quantity of material fed thereto, in order that the material baled or packed will be uniformly condensed throughout the bale or package. The mechanism is generally applied to a "Munger outfit" which includes a cotton condenser and feeder and a Munger cotton press. The valve mechanism of the press is operated from the condenser so that the speed at which the press is operated will always correspond with the speed of the feeding mechanism.

The second patent discloses the same general character of mechanism, but embodies improvements designed to economize steam or other motive fluid employed to drive the packer, and also to regulate the duration of the interval during which the packer remains at rest, to permit the feeding of a new charge of cotton or other material to the press.

Robert L. Everett, Harrisburg, Nebr. Power Generating Apparatus.—This patent discloses an ingenious apparatus for generating power. The apparatus includes what is called a vacuum chamber, an explosion chamber, and a pressure storage chamber, together with a peculiar arrangement of check valves and ignition mechanism. A suitable mixture is exploded in the explosion chamber, and the gases thus generated enter the compression storage chamber, creating a high pressure therein which may be utilized by any ordinary form of translating mechanism to perform work. At the same time, the escape of the gases from the explosion chamber and the partial vacuum thus produced, exhausts the air from the vacuum chamber, producing a partial vacuum therein which may be utilized for various purposes, as for instance, for elevating water through a stand pipe. The unusual character of the apparatus will be seen from this: that provision is made for utilizing the force of the explosion both to store a compressed fluid and to exhaust air from a vacuum chamber, so that, by the force of a single explosion, two distinct forms of available energy are created.

Clemens G. Bodungen, La Grange, Texas. Two patents. Mote Board.—The mote board of this patent which may be applied to cotton gins without necessitating any material change in the construction thereof, saves the nap, lint and motes, which are usually lost, and it prevents the nap, lint and motes from collecting under the gin stand or frame, where they are liable to take fire and destroy the cotton gin, and from whence it is necessary to remove them by hand, a proceeding that often results in the loss of a hand or arm. The mote board is also adapted to prevent the upward draft, which often interferes with the operation of the brush cylinder in opening the lint and separating therefrom the motes, nap and trash, and frequently carries the motes, nap and trash rearwardly through the flue or passage with the lint. The mote board consists of a relatively rigid portion partially closing the space at the bottom of the saws and brush cylinder, and a flexible apron or chute extension fitted in the space between the rigid portion

and the front of the gin stand and communicating at its outer end with the exterior of the stand.

The second patent discloses an improved form of connection for transmitting motion from the saw-shaft to the brush-shaft of a cotton gin. The mechanism is designed to overcome the various objections to the ordinary belt drive, and includes a pair of beveled friction wheels mounted on the opposite ends of the saw-shaft, and frictionally engaging a pair of comparatively small friction wheels mounted on the opposite ends of the brush-shaft and each made up of face plates and intermediate laminae of leather or other frictional material.

Alexis Vanderbeck, Roseland, Kans. Electric Motor.—Mr. Vanderbeck's patent discloses a motor designed more particularly for the translation of a current of comparatively low voltage into power which may be utilized for the operation of light machinery, such as printing presses, pumps, fans, and the like. To a suitable crank shaft are connected a pair of armatures by means of pitman. Each armature is located between a pair of magnets having their unlike poles opposed so that, when a current is passed through the coils of the magnets, the armature will be repelled by one magnet and attracted by the other. A rocking commutator is operated by the engine to close the circuit in the proper direction through the proper magnets, and by means of a reversing rocker, the order of operation of the commutator may be changed to effect the reversal of the motor.

William B. Tyler, Camden, N. J. Cleaning and Polishing Compound, Method of Treating Pictures and Garment Hanger. Three patents.—These patents are the result of a long series of experiments conducted by Mr. Tyler for the purpose of discovering a method for restoring pictures which have become faded and dull. One of the patents discloses the method finally evolved, and the other the compound used in practicing the method. Mr. Tyler has found that his method not only restores and illuminates old pictures, but imparts quality and tone to the coloring of pictures in general, including photographs, prints, etc. He has also found that the compound is highly efficient for general cleaning and polishing purposes.

The garment hanger which is designed for use by both men and women, is adapted to hold a considerable number of garments, for enabling the same to be properly cared for within a very small space. It consists of the bar or body portion, provided at its ends with projecting coat-supporting loops, and having a collar-supporting device at an intermediate point. The collar-supporting device is also adapted to engage a hook or a pole or rod, and it is composed of hook-shaped sides spaced apart to receive a pole or rod, and connected by an inverted U-shaped portion arranged at the bills of the hook-shaped sides to engage a nail or hook.

Cyrus E. Smith, Fall River, Mass. Two patents. Trolley Chain Tightener.—In the first invention, the trolley mounting at the upper end of the pole is provided with means which, while permitting the trolley wheel to move freely on a vertical axis to accommodate deflections and curves in the wire, will automatically restore said wheel to its proper position in alignment with the pole when the wheel leaves the wire, whereby the wheel may be easily replaced in contact with the wire by the manipulation of the pole in the usual manner.

In many machines employing endless sprocket chains, as, for instance, automobiles, and the like, it is difficult to remove or apply the chains, as it ordinarily requires that the sprocket

wheels be moved toward each other and afterwards re-set. A simple device patented by Mr. Smith is intended to obviate these objections. A frame is employed having a hook at one end that is arranged to engage one end portion of the sprocket chain to be connected. A shank is slidably mounted on the chain and also carries a hook that is arranged to engage the other end portion of the chain. The shank is threaded, and a thumb nut screwed thereon, has a bearing against the frame. In using the device, the hooks are engaged in the end portions of the chain to be connected, and the thumb nut is turned, thereby moving one portion towards the other. When the end links have been brought into alinement, they may then be readily connected in the ordinary manner.

Dr. John P. Brown, Rogers, Ark. Electrical Apparatus for Therapeutic Purposes.—This invention relates to improvements in electrodes that are employed for contact with the human body to secure the passage of the electric current thereinto. The present device comprises a supporting post and contact device, comprising a plate secured to the inner end of the post, a pad mounted on the plate, loops secured to the opposite sides of the plate, and stirrups secured to the outer end of the post. A body belt slidably passes through the loops and stirrup. Consequently when the said belt is applied, the electricity will properly contact with the body.

William A. Taylor, French Camp, Miss. Harrow Brace.—It is the object of this invention to provide an adjustable brace for that class of side harrows, which are provided with approximately triangular frames, and have the harrow teeth disposed transversely of the back of the frame. It effectually prevents the rear transverse portion of the frame from bending upward or backward, whereby the harrow teeth are prevented from sagging and are rigidly maintained in proper position. The brace is composed of sections and an adjustable connection. The front end of the brace is connected to a plate, which is secured between the front ends of the side bars of the harrow frame. The rear end of the brace is provided with an eye, which is arranged on the shank of one of the harrow teeth.

William A. Taylor, inventor; James A. Sanderson, assignee, French Camp, Miss. Locomotive Drive Wheel.—It is a well known fact that locomotive wheels in starting from a state of rest, ascending a steep grade, and making curves, often slip. The present invention obviates this objection. Wherever there is danger of slipping, a rack is located alongside the track rail, and the wheel is provided with the usual smooth tread that runs upon the rail and also with an annular flange that operates over the rack. A guide flange is disposed between the annular flange and the tread, and operates between the rack and rail. Radially disposed teeth are slidably mounted in the annular flange of the wheel and co-operate with the rack, and coiled springs located between the flanges bear against the teeth for holding the same in projecting relation.

George A. Kelly, Longview, Texas. Three patents.—The first of these is a plow, and the patent thereon has been assigned to the G. A. Kelly Plow Co. The invention relates more particularly to means for connecting and bracing the body, beam, and handles of the plow. The plow body consists of the usual standard, mold-board and heel. On the standard, the ordinary beam is mounted, while the handles are connected to the mold-board. Braces extend upwardly from the heel and are secured to the rear end of the

beam. These braces are sharply out-turned and are fastened to the handles, thus rigidly connecting all the parts and thoroughly re-inforcing the entire structure.

The other two patents of Mr. Kelly relate to rotary engines. Of these, the first has a novel arrangement whereby the steam is successively projected against the rotating piston and at the same time is expanded so that the full power is obtained. Moreover, the arrangement is such that the end thrust is entirely eliminated. Briefly described, the structure consists of outer walls, and a partition spaced from the outer walls, and forming therewith piston chambers. Rotary pistons are located in the chambers, and have peripheral blades. The walls and the partition are provided with channels having inwardly extending inlet and discharge mouths that open into the piston chambers on opposite sides of the pistons. Means are provided in the partition for introducing steam to the engine and initially directing the same against the piston blades.

The second patent while involving substantially the same idea, has a distinctly different structure, and is clearly applicable to either single or double piston engines. A sectional cylinder is employed, the side walls of which form between them a piston chamber. In this chamber is located the rotary piston which has peripheral radial blades. The walls of the casing are provided with steam conducting channels that have convergently disposed terminals communicating with the outer portion of the chamber so as to direct the steam against the blades. These channels may or may not successively increase in cross sectional area. They are preferably so increased, however, in order to permit the expansion of the steam as it passes about the cylinder and piston.

Joseph D. Hidy, Washington, Ohio. Corn Husking Machine.—A peculiarly novel and efficient mechanism is covered by this patent. A closed chamber is employed, communicating with which is an exhaust fan. The top of the chamber comprises sets of husking rolls, with guards arranged between and on the outer sides of the sets. The rolls are located at an inclination and have transverse channels in their sides. Gearing connects the rolls, so that the channels of each set rotate in unison and come together when the channels of the other sets are out of alinement. Snapping rolls are arranged at the upper ends of the husking rolls transversely thereof, and shredding mechanism is disposed in rear of the snapping rolls. The stalks are fed through the snapping rolls and are shredded by the shredding mechanism. The ears, dropped from the snapping rolls, pass to the husking rolls, and the husks are drawn downwardly between the rolls when the channels are in alinement by the draft of air caused by the fan, the rolls in turn entirely removing the husks. The husks thereupon drop into the chamber, and are driven by the fan from the same and into the material that is delivered from the shredding mechanism.

Truman Noble, Ithaca, New York. Card Memorandum Book.—This book provides a receptacle in which a number of cards may be stored, and employs in connection therewith, means for securely holding cards in proper condition to be written upon, the receptacle and holder being so related that the cards may be readily and conveniently transferred from one to the other, and when the device is not in use, the cards can be completely covered. The device is particularly adapted for outdoor use in making notes, as for instance by surveyors, and the like, and the same cards may be used as those employed in file cases.





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FOR SALE—Patent No. 774,693, Steering Apparatus for Ships, dated Nov. 8, 1904; and patent No. 755,928, Heat Regulator, dated March 29, 1904. Address, John Peterson, Lake George, N. Y. jy

FOR SALE—Patent No. 804,019, dated November 7, 1905. A perfect commode. Adjustable for sick and invalids, also children of any age. A handsome household article. Address, Louise Lotz, No. 640 Melrose Street Chicago, Ill. mar

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FOR SALE—Patent No. 770,756, dated Sep. 27, 1904. Displaying Device. Will sell outright or lease on royalty, or sell state rights. For particulars address, P. J. Hynek, Box 3, Shawnee, Oklahoma. feb

FOR SALE—U. S. Patent No. 804,127, dated Nov. 7, 1905. Improved rail or other joint, without nuts or bolts, or fishplates. Correspond with inventor, W. J. Huckabay, Sparta, La. feb

FOR SALE—Patent No. 804,106, dated Nov. 7, 1905. Combined fire place and stove. Can be arranged within or without a fire place, and may be used with either wood or coal. Correspondence solicited. Address, Walter A. Douglass, Pilot Mountain, N. C. feb

FOR SALE—Patented No. 794,328. End gate for wagon beds, dated July 11, 1905. A rodless wagon end gate. Will sell for \$5,000. Address, Henry Weber, Fairbury, Ill. feb

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FOR SALE—Patent No. 798,953, dated Sep. 5, 1905. Safety Stirrup for Saddle. Very simple and strong, and always ready to release the foot when required. Address, C. F. Eidenburg, No. 34 2nd. Avenue, Spokane, Wash. feb

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FOR SALE—U. S. Patent. Iron corner device for joining sides, ends, and bottoms of any make of wagon box. A crying demand for it for the past hundred years. Address, W. T. Johnson, Hinton, Okla. mar

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FOR SALE—Patent No. 806,718, dated December 12, 1905. Locking Bolt Mechanism. Adapted to locking doors, covers or closures to boxes, cases, crates, etc. Easy to operate. Address, T. Henry Bauer, Middletown O. mar

FOR SALE—U. S. Patent No. 789,369, and Canadian patent No. 94,945. Hay Baling Press. Light and easy to operate. Has been tested. Will sell one or both patents reasonably for cash. Address, W. D. Kelly, Kerrville, Texas. mar

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## Report of the Commissioner of Patents.

In the Official Gazette of January 30th, 1906, appears the report of the Commissioner of Patents for the year 1905. Eliminating the figures showing the receipts, expenditures, etc., the report, which occupies seven pages in the Gazette, may, by condensing and grouping under different headings, be considered as follows:—

### STATUS OF EXAMINING DIVISIONS.

"The condition of the examining divisions upon December 31, is indicated by the fact that of 38 divisions, 13 were then taking up amended cases for action within fifteen days from the date of the last amendment; 21 were acting on cases within one month from the date of the last amendment, and the remaining 4 were in arrears between one and two months. The new work was from one to eight months in arrears. The total number of cases awaiting action on the part of the Office upon December 31 was 17,004."

This means that an applicant has to wait from 1 to 8 months, for the first official action on his application for patent, but after it is once acted upon, it is then given reasonably prompt consideration as an amended application. Ninety-five per cent of applications for patents require to be amended in some respect. Some applications require repeated amendment. Because of this fact, the delays in considering amended cases has wrought, in the past, a great injustice to attorneys who were endeavoring to obtain for their clients all that they were entitled to. We have repeatedly urged that the recently-inaugurated practice of giving amended cases precedence, should be followed throughout the Patent Office. It is a matter of considerable satisfaction to us that the order is now in force. We believe that in the end more persons will be pleased by the operation of the new order than was possible heretofore. Moreover, the new order is in keeping with the rules of practice of the Patent Office. It is significant that the total

number of cases awaiting action is not increasing, but rather diminishing.

### REPRINTING COPIES OF PATENTS.

"The work of restoration of printed patents to the files of this Office has continued and has resulted in considerable saving of the amounts which would otherwise have been required for reproducing exhausted copies. Reproductions of such exhausted copies of patents are now promptly furnished, and practically all such exhausted copies are reproduced."

The obtaining of copies of patents by inventors and their attorneys is a matter of great importance in the conduct of the business before the Patent Office. In the past, it has been difficult and often impossible to obtain copies of patents which were exhausted. The information that practically all such exhausted copies will be reproduced, will be good news to those who practice before the Patent Office. In reports as to patentability, in the preparation of applications for patents, and in the prosecution of such applications, the need of having copies of patents, cited or pertinent to the invention, is paramount. It has happened in the experience of everyone, that quite frequently the best reference, or the only pertinent one, could not be examined or mailed because the supply of copies of such patent was exhausted. To remove this prolific cause of complaint, the Commissioner has taken this latest step. He is to be congratulated on his action.

### THE NEW TRADE MARK LAW.

"The most important event in the business of this Office during the year 1905 was the passage and taking effect of the new trade-mark law of February 20, 1905. This act reduced the fee upon filing an application for trade-mark from twenty-five dollars to ten dollars, and immediately resulted in a great increase in the number of trade-mark applications. The increase may be appreciated by comparing the number of applications received in the year 1905, 16,224, with the number in the preceding year, 2,524; the number filed the past year thus being about six and one-half times the number filed the preceding year."

We believe that if a more liberal spirit characterized the actions on trade-mark applications and some of the trivial objections which are now urged against such applications were omitted, the work of the trade-mark division, which is now several months in arrears, would not be so far behind. The new trade mark law was intended to correct some of the abuses and absurdities which had crept in, in the administration of the old law; but judging from some of the actions on trade mark applications, the trade mark law needs further amendment for the purpose of curtailing the "discretion" which actuates the trade mark division in its consideration of applications for registration. We understand that there is a movement on foot to bring about an amendment of the law.

### INCREASE OF THE FORCE.

"The work thus laid upon this

Office in the transaction of this large amount of new business has made it necessary to increase the force employed in the trade-mark division and has laid heavy burdens upon the examining divisions from which this force was drawn, as well as upon the clerical force drawn upon for the performance of the additional clerical work. To this should be added the increase in the number of applications for patents for the year 1905, such increase being 2,866. The great increase in these two branches of our work has overtaken the present force of this Office, which is not able to keep this work up to a satisfactory state of promptness under the existing conditions. I consider it a matter of absolute necessity for the prompt and satisfactory transaction of the work of this Office that an increase of force, both of examiners and of clerks, be provided by Congress, and estimates for increases in our force have been submitted for this reason.

An examination of the figures covering receipts, expenditures, and work elements of the operations of this Office for the years 1899 and 1905 discloses an increase in work of about 40%, and in this period the increase in the number of employees of the Office is twelve and eight-tenths per cent. Manifestly such growth cannot continue without an increase of force corresponding to the increase of work; and in view of the fact that the general balance from the operations of this Office for the year 1905 amounts to \$327,124.92, as shown in the preceding table of receipts and expenditures, I am of opinion that so much of this surplus as is necessary for the purpose should be devoted to increase of force to meet the existing conditions.

The increase of work and of force heretofore referred to calls attention again to the fact that the space allotted to this Office is not sufficient for the satisfactory and economical transaction of its business, and further space is greatly needed, and if furnished would result in economy in the operations of this Office."

We heartily commend this appeal for more men and more room. The examiners of the Patent Office are compelled to work in unsanitary quarters, in many instances from six to eight persons in one medium-sized room. In some instances the rooms are so dark that they have to be kept lighted artificially throughout the day. In a few cases, an examiner may have one of his rooms in one part, and another room in another part, of the building. The whole arrangement is very discreditable to the government. The Patent Office is one of the few institutions under the government which pays for itself, there being a surplus of several millions to the credit of the Patent Office in the treasury of the United States. If inventors had the political pull which pensioners have, the conditions in the Patent Office would be different. What the Patent Office most needs is room. After that, an increase of twenty-five per cent at least in the force of the examining corps. Everybody interested in this matter should work with the end in view of accomplishing these results.

### Public Use.

An examination of the decisions of the courts in patent cases is always interesting, both to the student as well as the practitioner. It will be found that notwithstanding the care exercised by the Patent Office in granting patents, some of them are declared invalid, either on the grounds of anticipation, lack of invention, or two years public use. Of course the Patent Office has no means of determining, in each case, if the invention has or has not been in public use for two years prior to the filing of the application for patent.

When, however, information is brought to the attention of the proper officials of the Patent Office, during the pendency of an application for patent, that the invention embraced therein had been in public use for two years prior to the filing of the application, then what is known as "public use proceedings" are instituted for the purpose of ascertaining the facts of the alleged public use. These occurrences are naturally rare, for the Patent Office accepts the oath of the applicant accompanying the application, averring that the invention has not been in public use or on sale in the United States for more than two years prior to the filing of the application for patent.

There seems to be some misunderstanding among inventors as to what public use is. They usually think that it means use in the presence of the public for a continuous period of two years. Of course, this is not the law. There is the extreme case of a party who invented a corset, made a sample, gave it to a lady to wear, and did not apply for a patent within two years from the time the corset was given to the wearer. This single use, which could hardly be regarded as "public," was nevertheless held to be public use within the meaning of the statute, and the patent was declared invalid.

There is another case in which the inventor of a pavement paved a roadway in the manner contemplated by his invention. The roadway was in use approximately eighteen years. The Supreme Court held that this was a mere experimental use, since it required many years of actual wear to test the durability of the pavement, and that the use was not for purposes of profit.

The test in every case is whether the particular use was for experimental purposes only, or for profit. If the former, the patentee is not prejudiced thereby; if the latter, the right to a patent is defeated. However, these questions would never arise if inventors would make applications for patents as soon as their inventions are completed and tested. In cases of contest, the long-delayed filing of an application for patent, even where the invention is completed, raises the presumption of abandonment. We are not in favor of a hurried filing of an application just as soon as the invention is conceived; for quite often a little investigation will show, either that there is no demand for the invention, or that it needs perfecting. But the custom of putting an invention on the market before applying for a patent is dangerous, as time passes so rapidly that before the inventor realizes it, the two years has expired and the right to a patent is gone.



### A Home for Indigent Inventors.

A home for indigent inventors is the latest thing among charitable institutions in this country. It is to be built in New York City, so the papers say. Its proper place is in Washington, near the Patent Office—the graveyard of many an inventor's hopes and air castles. One of its promoters is J. W. Bunker, who, unlike many inventors, has made money on inventions and proposes to spend some of it on his less-fortunate brothers. In discussing the matter recently, Mr. Bunker said: "There are hundreds, if not thousands of inventors in America today, who are poor men. Many of them have been enriched by some invention, only to sink their wealth in the promotion of another patent. For some strange reason the world at large has always shown a sort of a slight for these men of genius."

"We are not bothering ourselves about finances, because we already have enough money to build the home. It will be conducted like the ordinary charitable institution, except that there will be an atmosphere of the clubhouse. We will have lawyers employed to aid inventors without means, and in many ways we will offer improved opportunities as well as the comforts of life."

The AGE takes great pleasure in commending this worthy enterprise, and believes that it will do a world of good to a worthy class of men.

### In The "Good Old Times."

It is only by means of comparison that we realize the benefits conferred by modern civilization. The attention recently given to the life and achievements of Benjamin Franklin recalls the fact that when he first thought of starting a newspaper in Philadelphia, many of his friends advised against it, because there was a paper already published in Boston. It was believed that the country would not be able to support two newspapers.

In his days, the fastest land travel was by mail coach. When he first went from Philadelphia to New York, he spent four days on the journey. He tells us that, as the old driver jogged along, he spent his time knitting stockings. Two stage coaches and eight horses sufficed for all the commerce that was carried on between Boston and New York, and in winter the journey occupied a week.

Not until February of 1812 did the people of Kentucky know that Madison was elected President in the previous November; and when Thomas Jefferson was selected for the same office, after one of the most exciting political campaigns in our history, the gratifying news did not reach the successful candidate, himself, for as many days as it now takes hours to transmit the result of a presidential election to the whole civilized world.

When in 1809, Richard Trevithick predicted "This generation will use canals, the next will prefer railroads with horses, but their successors will employ steam carriages on railroads as the perfection of the art of conveyance," he was considered an insane, dangerous person.

The first typewriter was received by

the public with suspicion. It seemed subversive of existing conditions. A reporter who took one into a court room first proved its real worth.

When the first two tons of anthracite coal were brought into Philadelphia, in 1803, the good people of that city, so the records state "tried to burn the stuff; but, at length disgusted, they broke it up and made a walk of it. Fourteen years later a man sold eight or ten wagon loads of it in the same city, and warrants were promptly issued for his arrest for taking money under false pretenses."

Napoleon, at the height of his power, could not command our every day conveniences, such as steam heat, running water, bath and sanitary plumbing, gas, electric light, railroads, steamboats, the telegraph, the telephone, the photograph, daily newspapers, magazines and a thousand other blessings which are now part of the daily necessities of even manual laborers.

### A Rapid Churn.

A churn that makes butter in sixty seconds is on exhibit at the Agricultural Hall in London. The machine is so handy that it might be placed on the tea table as an accessory to the cups and teapot, and yet not look out of place. Given the requisite quantity of cream, with a temperature of 60 degrees, butter can be made at any time desired. The new device does not even need a special vessel for holding the cream. The latter is placed in the vessel so that the dasher is in the center, and about one and a half inches below the surface. The handle is turned slowly for a few seconds, and then at a good speed, and within one minute butter is formed. If fresh cold water be then poured in, and the handle turned slowly two or three times, the butter is ready for washing and making up.

### New Paints.

A new water paint, made in a great variety of beautiful colors and possessing valuable advantages, has been introduced under the name of washable water paint. The paints are sent out in paste form, and only need to be thinned a little to be available for use. They are applicable to plaster, wood-work, brick, stone, canvas, iron, or in fact to any material on which ordinary paint can be used. For use in outside or exposed positions, they are mixed with a so-called petrifying liquid, which makes them comparatively impervious to the weather.

A new white paint has been recently patented, which is claimed to far excel white lead and other similar products in fineness and smoothness of surface, covering power, permanence, and cheapness. It is obtained by saturating burnt lime containing magnesia with a hydrocarbon, and firing until all the carbon is burned. The material is then ground fine and colored ready for treatment with linseed or other suitable oils. A dolomitic limestone, containing from 20 to 40 per cent of magnesia, is said to be best for the purpose, although a limestone having less than

20 per cent may be enriched by adding the desired quantity of magnesia; but with results that are not so good. Other pigments can be mixed with the material to produce paints of any desired color. The advantages claimed for the paint are that it dries quickly without driers, is unaffected by light, and not changed by ammonia, sulphureted hydrogen or sulphurous acid; that the coating hardens like enamel after some months, possesses a dull gloss, does not blister in the sun, and is washable; yet that it retains its original smoothness. The paint is suitable for walls and wood work of all descriptions.

### New Telephone Device.

The suggested transmission of disease by telephone mouthpieces has led an electric company to devise an instrument in which all danger is avoided by simply abolishing the mouthpiece. The receiving and transmitting apparatus is combined in a small metal case, shaped like a watch, which is held continuously to the ear both in speaking and in listening, the transmitting microphone being made so sensitive that it becomes unnecessary to concentrate the sound waves on it by the aid of any mouth piece such as is ordinarily used. Mounted on a handle, with a speaking key, the new arrangement is exactly similar to the combined receiver and transmitter in common use, except that there is no mouthpiece; and the speaker, as it were, addresses himself to the world at large, instead of talking into a trumpet-shaped orifice.

### Bread Making Machine.

Every housekeeper will be interested in a bread making machine, by which wheat is turned into bread by a continuous process, with no hand labor. This is the invention of a London baker, and it is not only a labor and time saving device, but it might also be called a machine saving machine, so greatly does it simplify the process of preparing the staff of life. For instance, at present the miller grinds his wheat perhaps as many as fifteen times to obtain the best flour—the fine white grade demanded by the fastidious. By the new method, the wheat is ground only once. This grinding gives three products—flour, middlings and bran. The flour is conducted to the bin, the bran is mechanically carried and automatically weighed into sacks, while the middlings pass into tepid water, by which all the floury part is washed out. This water, impregnated with nutritious material, flows into the kneading pan, in which the dough is automatically produced. The dough is left to rise for about two hours, is then shaped into loaves, and forty minutes later an electric delivery wagon distributes the hot bread through the city of London.

The bakery where these wonders are worked turns out 11,000 loaves and 8,000 rolls per day; but this is a mere trifle compared with the output of an establishment which the owner is now erecting, which will have 400 ovens, and a calculated production of 300,000 pounds of bread a day. The invention will yield handsome profits, as

the commission at present made by the middleman, as well as the cost of transport and consequent waste in handling, will be saved. It is also claimed that the price of bread will be reduced. This important article of food now costs 10 cents a loaf in London, and it is believed that this price can be cut nearly in half. As the great city consumes 6,000,000 pounds of bread a day, the invention may effect a daily saving of \$60,000, or over \$20,000,000 per annum, to London alone. Although we are more fortunate, on this side of the ocean, in having to pay only 5 cents a loaf for bread, no one will object to having the price further reduced.

### Fireproof Flooring.

Considerable interest has been manifested among architects and builders in a new fireproof flooring, which has come into general employment in Germany. The use of jointless flooring, made from pulverized wood fiber and other materials, and held in a plastic condition on a cement foundation, was begun several years ago, and has proved most successful. "Stone wood," as it is called, is a plastic substance of about the consistency of mortar, made of pulverized wood fiber, asbestos, and a mineral substance, and colored by the admixture of various oxides to any desirable tint—such as terra cotta, gray, cream, or grained in imitation of veined marble.

The flooring is laid down in a smooth, even layer, half an inch thick, upon the cement substructure, which in German construction rests upon steel joists and forms the foundation of all floors, whether of wood, marble or other materials. The problem has been to make a continuous flooring which should cover the entire area of an ordinary room, fit closely at its junctions with upright walls and be not only fireproof, but impervious to liquids, dust, vermin of all kinds; a poor conductor of heat and sound, easily cleaned, and withal neat and slightly in appearance. All these requirements have been successfully attained by the "stone wood." In practice it has been found that the plastic flooring adheres firmly to the cement foundation, so that when the latter is subjected to any severe strain or fracture, through extreme changes of temperature or the uneven settling of the building, the flooring is liable to crack under the tension thus created. To obviate this, the plan has been adopted of laying between the substructure and the fireproof flooring, an insulating layer of a composition made of fine cork chips, asbestos, sawdust, and some cohesive matrix to hold the other ingredients together. This intermediate layer of comparatively light elastic substances separates the wood-stone flooring from the cement foundation, makes it warmer and less resonant, absorbs whatever moisture may percolate from the outer walls, and—what is most important—enables the floor to be laid completely jointless and impermeable over a large surface and joined tightly at the edges to the circumscribing walls.

The composition of the cork asbestos layer is such that it remains to some degree elastic after it has become firm, and it therefore takes up and neutralizes the effect of any cracks that may occur in the cement base without affecting the surface of the stone-wood floor.

When finished, the flooring has a surface like that of a polished marble. The wood-stone is used for large departments where smoothness, cleanliness and imperviousness to water, chemicals, fire and decay are indispensable requisites; and it is considered to represent the biggest standard of modern construction in this line.



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies \$1.50.—Please give correct data in ordering.—Address,

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 Golf ball ..... 2 pats. W. I. Thomas  
 Gong attachment ..... J. T. Duff  
 Goods receptacle. Paneled ..... J. I. McVoy  
 Grab hook ..... F. J. Morrison  
 Grader. Road ..... F. B. Drewes  
 Grain drill seedbox ..... C. L. Fowle  
 Grinder ..... G. W. Golden  
 Gun. Air ..... D. F. Polley  
 Gun attachment ..... A. T. Wright  
 Guns. Firing mechanism for breech loading ..... G. Gerdorn  
 Hair drier ..... F. S. Emmons  
 Hair pins. Mold for the manufacture of ..... T. Roos  
 Hame and trace connector ..... F. F. Hodges  
 Harrow ..... G. A. Truckenbrod  
 Harvester reel ..... J. Pearce  
 Hat fastener ..... J. C. Morrison  
 Hay and manure gatherer and loader ..... J. Peterson  
 Hay press power ..... W. S. Bryant  
 Hay racks or the like from or to their running gear. Device for removing or replacing ..... G. P. Finch  
 Head block ..... H. C. Lindly  
 Heating apparatus ..... W. S. Washburn  
 Heating apparatus ..... O. S. McCurdy  
 Heating apparatus. Hot water ..... W. H. Beames et al  
 Heel building machine ..... W. Wolfe  
 Hinge ..... J. Soss  
 Hinge. Flush ..... T. F. Salig  
 Hinge. Gate ..... J. A. Jones  
 Hinge. Wire ..... C. D. Reece et al  
 Hitching post ..... W. B. Luquire  
 Hoist. Hydraulic ..... U. Harvey  
 Hoist or elevator ..... C. A. Juhl  
 Hoister drums. Automatic holdfast for electric ..... A. Lambert  
 Hoisting apparatus ..... S. L. G. Knox et al  
 Hoisting machine ..... W. M. Brown  
 Hollow bodies. Apparatus for forming serpentine ..... K. Park  
 Hook ..... L. Jones  
 Horse blanket ..... P. Andersen  
 Horse power calculating device ..... E. M. Scoville  
 Horseshoe ..... J. T. Bell  
 Horseshoe ..... J. Singleton  
 Horseshoe attachment ..... J. P. Gagner  
 Horseshoe calk ..... E. F. Atherton  
 Horseshoe pad ..... A. Fischer  
 Horseshoe. Rubber ..... A. Lang  
 Hot water circulating apparatus ..... A. B. Reck  
 Hydrant ..... V. H. Mills  
 Ice can filler ..... G. S. Bowling  
 Ice machine ..... R. S. Cates  
 Illuminant ..... J. Lewy  
 Index card ..... J. S. Duncan et al  
 Index. Station meter ..... D. McDonald et al  
 Induction apparatus contact device ..... R. O. Hood  
 Induction coil vibrator ..... R. Varley  
 Induction motor ..... A. L. Cushman  
 Insulator. Electric light fixture ..... L. McCarthy  
 Internal combustion engine ..... S. S. Williams  
 Internal combustion engine ..... T. Wright  
 Invalid lift ..... O. B. Thompson  
 Iron compounds. Making stable non alcoholic ..... K. Dieterich  
 Jewelry catch ..... R. Kollmar  
 Joint for sheet metal and the like ..... E. P. Lehmann  
 Knitting machine ..... B. T. Steber  
 Knitting machine stop motion ..... E. Tomkins  
 Knob ..... K. Booth  
 Labels and the like to bottles and other articles. Machine for applying ..... B. W. Tucker  
 Ladder attachment ..... J. K. Hester  
 Lamp burner ..... W. M. Merchant  
 Lamp burner ..... P. Joyal  
 Lamp safety shield. Miner's ..... R. I. Jenkins  
 Lantern burner device. Tubular ..... D. C. Kline  
 Lathe. Screw making and metal turning ..... H. P. Trueman et al  
 Lathe work rest ..... W. F. Parsons  
 Laundries and the like. Garment marker for ..... D. C. Voss  
 Leaching tank ..... A. B. Mouck  
 Leaf holder for use in transferring entries ..... J. M. D. McGregor  
 Leather working machine ..... F. J. Perkins  
 Lens mounting for eyeglasses ..... J. R. Van Tassel  
 Level. Spirit ..... J. A. McCain  
 Level. Spirit ..... C. S. Brown et al  
 Lift separator. Automatic ..... S. W. Sinzheimer  
 Lighter ..... A. E. Caughy  
 Lightning arrester ..... F. A. Stafford  
 Linotype machine ..... M. W. Morehouse  
 Linotype machine ..... J. R. Rogers  
 Linotype machine attachment ..... J. H. W. Knoop  
 Locomotive ash pit and blower ..... H. E. Parson  
 Liquid combustibles. Apparatus for vaporizing ..... J. Luhn  
 Locomotive. Electric ..... A. F. Batchelder  
 Locomotive engine ..... J. E. Roberts  
 Locomotive shuttle spindles. Pivot bolt for ..... C. F. Thompson  
 Loom tension device ..... E. Herzig  
 Loom. Weft replenishing ..... H. W. Wyman  
 Loom. Weft replenishing ..... C. Whalley  
 Looms. Cloth tension device for take up mechanism for ..... C. S. Andem  
 Mail bag catcher ..... L. J. Evans  
 Mail box ..... E. M. Raymond et al  
 Mail box bulletin ..... J. M. Larsh  
 Mail deliverer ..... H. L. Kimmons  
 Mail pouch fastener ..... L. H. Hinaman  
 Mail transferring device ..... C. Krepes  
 Map case ..... J. Dawson et al  
 Match making machine ..... E. J. Prindle  
 Match making machine. Automatic ..... G. P. Loomis  
 Matte. Converting ..... C. M. Allen  
 Matte. Treating molten ..... W. E. Koch  
 Measuring device. Liquid ..... F. S. Turner et al  
 Measuring tape ..... E. L. Saxton et al  
 Measuring vessel. Computing ..... W. S. Cain  
 Mechanical movement ..... A. W. Hutchins  
 Mechanical movement ..... R. T. Wingo  
 Metal bars. &c. Machine for bending ..... N. S. Arthur  
 Metal bars. Shaping ..... E. Einfeldt  
 Metal. Planishing sheets of ..... A. Ridd  
 Metal treating and amalgamating apparatus ..... G. P. Tyars  
 Metals. Apparatus for the agitation of solutions used in electrodeposition of ..... W. C. Wood et al  
 Micrometer. Quick adjusting ..... L. S. Starrett et al  
 Milk pressure and making same ..... L. Sarason  
 Mining cage landing chair ..... G. H. Denton  
 Mining machine ..... D. R. Murphy  
 Mitt. Base ball catcher's ..... J. Gamble  
 Mold ..... W. H. Lucas  
 Mold ..... J. H. Johnson et al  
 Mop holder ..... H. Bitner  
 Motor control system ..... W. B. Potter  
 Motor reverser. Alternating current ..... E. H. Porter et al  
 Motors. Equalizing winder for spring ..... C. Pfeiffer  
 Musical instrument. Autopneumatic ..... W. Crippen  
 Musical instrument. String ..... F. P. Alexander  
 Musical instruments. Pneumatic action of ..... M. S. Wright  
 Nail. Secret ..... W. J. Boda  
 Napkin. Sanitary ..... P. S. Baner  
 Nest for laying hens. Trap ..... C. B. Williams  
 Nut lock. Automatic ..... J. T. Clark  
 Oar. Bow facing ..... F. L. Buff  
 Ores and metalliferous sands. Applying heat for the treatment of ..... W. J. Jackson  
 Ores. Treating ..... J. H. Haynes et al  
 Overlay ..... C. W. Combs  
 Overshoe ..... A. E. Roberts  
 Packing ..... J. Ostrander  
 Pantograph ..... N. H. Brown  
 Paper bag machine ..... F. E. Strasburg  
 Paper feeding machine ..... C. B. Stilwell  
 Paper machine head box ..... W. McNaught  
 Pastry. Hollow roll ..... F. Diener  
 Paving stones. Manufacturing artificial ..... W. Schmacher  
 Peanut thresher ..... J. T. Delk  
 Pen. Fountain ..... J. A. L. Snyder  
 Pencil holder ..... I. C. Reesor  
 Perforating machine ..... H. D. Jacobson  
 Petroleum. Eliminating sulfur from the surplus containing constituents of ..... H. S. Blackmore  
 Petroleum. Extracting sulfur from the sulphur containing stituents of ..... H. S. Blackmore  
 Photographic plate and film lifter ..... J. J. Lintz  
 Photographs. Apparatus for permitting the successive exhibition of ..... C. Fongrat  
 Piano actions. Hammer supporting flange for ..... C. P. Blinn  
 Piano playing attachment ..... H. McPhail  
 Piano. Swinging frames. Regulating hinge for ..... I. E. Bretzfelder et al  
 Pile driver ..... A. Bishop  
 Piling. Metal ..... 2 pats. J. J. Harold  
 Pipe cleaner ..... F. A. Falt  
 Pipe coupling ..... 2 pats. A. T. Herrick  
 Pipeline. Fluid ..... J. B. Speed  
 Pipeline. Helically rifled fluid ..... D. J. Isaacs et al  
 Pipe tongs or wrench ..... E. Duggins  
 Pipe wrench ..... R. Adams  
 Pipe wrench ..... G. W. Waitt  
 Pivot gaging machine ..... D. H. Church  
 Plate press ..... R. Turner et al  
 Plow ..... W. Connor  
 Pneumatic tube carrier ..... B. C. Batcheller  
 Pneumatic tubes. Combined doorlock and indicator for carriers used in ..... P. J. Madigan  
 Potato digger ..... 3 pats. J. Hst  
 Power transmission device ..... G. W. Marble  
 Press ..... O. Smith  
 Pressure retainer. Automatic ..... J. W. Brown  
 Printer's composing stick ..... F. M. Barker  
 Printer's register hook ..... J. E. Lee  
 Printing fabrics ..... P. Jeanmaire et al  
 Printing. Photomechanical multicolor ..... M. N. Weyl  
 Printing plate holder ..... E. R. Storm  
 Printing press bed and cylinder motion ..... M. J. Barnett  
 Printing press. Flat bed web ..... H. F. Bechman  
 Printing press mechanism ..... J. J. Mosher  
 Propeller wheel ..... F. Chimzar  
 Propelling device. Vessel ..... P. Carlson  
 Pulley. Expandable ..... I. P. Brennan  
 Pulp screen. Centrifugal ..... J. H. Baker et al  
 Pulverous material. Process and press for pressing ..... C. von Pelchrzim et al  
 Pump ..... A. K. Miller  
 Pump. Air ..... D. Mills  
 Pump. Centrifugal turbine or similar ..... F. Ray  
 Punching machine. Metal ..... G. C. Andrews



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## MECHANICAL PATENTS.

Accounting appliance. Credit P. A. McCaskey  
Acid, &c. Making boric. H. Blumenberg, Jr  
Acids. Making dialkyl-barbituric. M. Engelmann  
Adhesive and making same. F. H. Patch  
Adjustable bracket. S. Kahn  
Air brake. Anchor emergency. C. Z. Sanders  
Air heating system. F. S. Lansen  
Ammunition hoisting mechanism. J. F. Meigs et al  
Amusement apparatus. E. S. Timmons  
Anchor. Earth. E. C. & H. Holden  
Anchor post. R. Witte  
Anthracene compound and making same. O. Rully et al  
Antiseptic compounds. Making solidified. D. Genese  
Antitoxin for fatigue and making the same. W. Weichardt  
Asymmetric cell. M. Buttner  
Auger bit. J. Stein  
Automobile body. A. R. & F. S. Welch  
Automobile dust allayer. W. H. Parker  
Automobile frame. A. R. & F. S. Welch  
Automobile race course. J. B. Thomas et al  
Axle box. Railway car. H. Stuting  
Axle truss. C. M. Haeske  
Bag fastener. E. G. Staude  
Bales. Machine for forming round cotton. C. M. Cagle  
Baling press. J. W. Reynolds  
Baling press. J. Unfried  
Barrel head. Removable. A. Jaeger  
Barre, opener. I. S. Knight et al  
Basement and the like ventilator. P. H. Jackson  
Basket. Clothes pin. S. W. Hurlburt  
Batteries. Machine for filling dry. P. P. Nungesser  
Battery plate. Storage. D. P. Perry  
Bearing. Vertical shaft. E. W. Broomall  
Bed and cabinet. Folding. N. Lui  
Bed corner fastening. B. H. Jones  
Bed sofa. G. N. Wersel  
Bedstead attachment. W. A. Wright  
Bell push, pull, &c. S. Wilks  
Belt shifter. F. W. Sevboth et al  
Billiard and pool tables. Cigar holder for. E. E. Hanks  
Binder. 5 pats. F. A. Cleveland  
Binder attachment. A. Williams  
Binder. Loose leaf. E. G. Dumas  
Binder. Loose leaf. L. Sussman  
Bismuth disalicylate and making same. R. R. Seifert  
Bleaching fibers. J. Wakefield  
Blind slot fastener. Window. M. J. Coogan  
Block molding machine. H. P. Gates  
Bobbin holder. T. J. Murdoch  
Bolster. A. E. Ostrander  
Bolt clipper. I. Pulvitt  
Book support. J. MacCallum  
Bookbinder's gage. A. Von Auw  
Book closure. J. C. Condo  
Bottle corking machine. R. J. Schlosser et al  
Bottle filling machine. F. B. Thatcher  
Bottle. Non refillable. C. H. Dolan et al  
Bottle washing machine. W. H. Loew et al  
Bottles non refillable. Device for rendering. J. Iuppert  
Bottling machine. E. L. Miller  
Bowling alley. D. Miller  
Box corner trimming machine. J. T. Leckenby  
Bracelet. P. H. Lettre  
Brake shoe. W. H. Namack  
Brake shoe. H. L. Winslow  
Breech block. Lever actuated wedge. M. Hensdorf  
Bridge safety gate. Draw. J. B. Lardialis  
Bridle bit. C. H. Falls  
Broiler. J. M. Stokoe  
Brooder. N. Saltonstall  
Brooder. Pig. H. B. Vail  
Buckle. F. T. Whitted  
Bugey top curtain holder. C. W. Noble et al  
Burial casket. M. S. Leech  
Butter cutting device. H. Schnackenberg  
Button. E. Zeckhauser  
Button guard. Collar. F. H. Norris  
Buttonhole. F. H. Walden  
Cableway. T. S. Miller  
Calcium carbide. Apparatus for the production of. E. F. Price et al  
Calculator. S. S. Fry  
Calculator. F. G. Johnson  
Camera lenses. Screen for photographic. H. S. Miller  
Can opener. H. B. Ray  
Can opener. J. W. Davis  
Can safety device. Oil. B. Buccieri  
Candies. Dipping frame for coating. P. Panoulas  
Cane mill feed box. J. P. Golden  
Canisters, &c. Machine for cutting and pressing. A. Von der Linde  
Car door lock. W. F. Wendt  
Car dump. T. R. McKnight  
Car fender. Street. W. Martin  
Car frame. W. R. McKee, Jr  
Car frames. Post and carline for railway. W. F. Kiesel, Jr  
Car. Hopper bottom. J. S. Stevenson  
Car journal box. J. H. Schrader  
Car. Motor. F. W. Lanchester  
Car platform gate. H. Witte  
Car. Railway. L. A. Hoerr  
Car roller side bearing. Railway. E. S. Woods  
Car roof. Metal. I. C. Campbell  
Car wheel. Sectional. G. W. Richards  
Cars. Steel underframe for railway. W. F. Kiesel, Jr  
Carbonating apparatus. Automatic attachment for. H. W. Van der Vaart  
Carpet stretcher. S. J. Weyer  
Cement brick press. H. B. Murdock  
Chain links. Forming helices for. I. D. Weaver  
Chain links. Manufacture of helices for. I. D. Weaver  
Cheroot machine. J. R. Schmitt  
Chimney holder. A. R. Cooper  
Chuck. Drill. C. Gordon  
Churn. D. Avers et al  
Cigar cutter and lighter. Combined. W. H. Crawford

## DESIGNS.

Ash tray. A. Q. Walsh  
Automobile body. E. R. Thomas et al  
Belt. D. Hirschberg  
Bracelet. C. S. Hurd  
Cradle. Souvenir. C. C. Boykin  
Finger ring. J. L. Herzog  
Lamp. I. H. Atwood  
Lamp. Vehicle. E. C. Everett  
Padlock. A. W. Douglas  
Paper. Wrapping. F. O. Wagner  
Spoon or fork. C. A. Bennett  
Table and folding bed. Combined. C. P. Davies  
Tablet board. C. B. Macfarlane  
Tank indicator. E. Rahm et al  
Tap. Current. W. D. Harris  
Telegraph key. A. E. Peterman  
Telegraphic key board apparatus. P. B. Delany  
Telegraphy. Wireless. P. B. Delany  
Telephone exchange system. Semi-automatic. A. T. M. Thomson  
Telephone holder. L. S. Hollowell  
Telephone signaling apparatus. K. H. Poyas  
Telephone system. H. A. Judge  
Telephones and the like. Ringer for. E. R. Hobbs  
Temperature regulating means. W. Wadsworth  
Thill coupling. C. Vives-Navarro  
Ticket holder. N. A. Planchin  
Tie liner and spacer. W. T. Pace  
Tire protector. Pneumatic. H. David  
Tires. Non skidding device for. C. R. Bullard  
Tool clamp. Hydraulic. R. D. Fildes  
Tool. Combination. E. J. La Duke et al  
Tool holder. C. L. Goodrich  
Tool holder. B. M. W. Hanson  
Toothpicks. Apparatus for the manufacture of. H. S. Hooper  
Top. J. W. Grattan  
Torpedo guard. Marine. J. Neumaier  
Toy. F. W. Carpenter  
Toy. I. N. Phipps  
Toy pistol. F. M. Ball  
Toy pistol. L. H. Hinman  
Track sanding apparatus. F. W. Wittkowski  
Traction engine. L. O. & F. B. Smith  
Traction engine. M. W. Kouns  
Traction wheel. M. Lafaver et al  
Trailing fender. E. G. Solomon  
Trains. Sewerage system for. J. H. Mettenheimer et al  
Transformer. J. I. Frank  
Transformer. Regulating. H. J. Blakeslee  
Trap. C. Spindler  
Trestle. Combination adjustable. I. W. Meisel  
Trolley device. F. J. Ludolph  
Truck. reissue. H. Weber  
Truck. Collapsible. C. E. Fischer  
Trunk. M. E. Morgan  
Truss. M. B. Smith  
Tube drawing apparatus. G. Baehr  
Turbine. C. E. Smith  
Turbine engine. E. J. Wood  
Turbine engine. H. Scheele  
Turnbuckle. J. A. Steinmetz  
Typewriting machine. H. L. Arnold  
Typewriting machine. H. W. Merritt  
Typewriting machine. C. H. Shepard  
Umbrella. M. G. McGuire  
Updraft kiln. E. A. King  
Valve. E. E. Hartgrave  
Valve and faucet reseating device. A. Eberlein  
Valve for hydrant pipes. Drain. F. A. Jacobs  
Valve mechanism. J. M. & E. W. Raikes  
Vapor electric apparatus. A. M. Jackson  
Vault lights, floors, &c. Bracing for. J. Jacobs  
Vehicle. J. T. Furchtar  
Vehicle cover. W. Findlay  
Vehicle. Dumping. S. C. Lancaster  
Vehicle repairing device. C. W. Lavers  
Vehicle wheel. M. G. Babio  
Vehicle wheel. G. D. Munsing  
Veneer cutting machine. J. I. Russell  
Vessel. Marine. J. E. Johnson  
Violin bridge. T. L. Davis  
Vise. F. M. Stambough  
Vise slide. E. M. Walker  
Wagon brake. Automatic. E. F. Veatch  
Wagon. Dumping. G. W. Crane  
Wagon spindle. A. J. Bellel  
Wagons. Front bolster and body support for children's. O. P. Erard  
Wall mold. J. H. Gehr  
Wardrobe hook. B. Z. Schreyer  
Washbowl valve. D. W. York  
Washbowl attachment. M. W. Story  
Watch. Stop. A. C. Loker  
Water closet. C. H. Rollins  
Water cooler. 2 pats. G. E. Savage  
Water heater and pressure reservoir. Combined. F. L. Rice  
Water supply system. Automatic. J. Johnson  
Wave motor. C. A. Sahlgren  
Weaving. L. Lemieux  
Welding apparatus. Socket. D. Heggie  
Well pulling machine. O. D. Kraft et al  
Welt making machine. reissue. G. E. Rollins  
Wheel structure. I. Ledwinka  
Wheels. Construction of. T. R. Ramont  
Windlass. T. F. Mason  
Windmill. M. S. Newcomer  
Window platform. Collapsible. E. G. Raff  
Window screen. F. S. Smith et al  
Window screen fastening. B. C. Rockwell  
Window ventilator. A. A. Stephens  
Windows. Air stop for. W. A. Davis et al  
Wire carrier. F. L. Sessions  
Wire stretcher. D. K. Kirkland  
Wire stretcher. Z. A. Curtis  
Wireless and other transmissions. Receiver and recorder for. F. E. Gallagher  
Wood conveyor. G. G. Hughes  
Woven fabric. T. B. Dornan  
Wrapper transferring mechanism. F. L. Herrington et al  
Wrappers to magazines, books, and the like. Machine for applying. B. W. Tucker  
Wrench. H. T. Thompson

Cigar bunching device. N. Thielen  
Cigar machine. W. S. Luckett  
Cigars, cigarettes, cigar fillers, &c. Machine for the manufacture of. M. Van Guiper  
Clamp. J. Wrigley  
Clevis. Interlocking. N. M. Lien  
Clinometer. B. Kern, Jr  
Clutch mechanism. M. G. de Simone  
Coal cutting machine feed. F. Eckersley  
Coatings upon metals. Electrolytic production of lustrous metallic. A. Classen  
Cock. Basin. P. Mueller  
Coffin drop handle. G. A. Schehr  
Coke oven cover. A. H. Walstrom  
Collar. Horse. G. W. Hahn  
Collar. Horse. C. L. Allen  
Combination gage. F. Gump  
Composition of matter. B. C. Senton  
Computing device. G. M. Brown  
Concentrator. Frue. L. R. Tulloch  
Concrete block machine. J. A. Blake et al  
Condenser. J. F. Grace  
Conductor. Protected. A. M. Lougee  
Confectioner's sizing and cutting machine. G. F. Dickson  
Control system. 2 pats. F. E. Case  
Conveyer. J. W. Mackin  
Conveyer. A. Tomkins  
Coop. Poultry shipping. F. M. Gault  
Conveyer. G. Lucas  
Copy holder. A. D. Long  
Coping press. F. E. Jagerberg  
Cord clamp. E. Nelson  
Crane. W. B. Erskine  
Crane locking device. J. R. Whittemore  
Crane locking mechanism. J. R. Whittemore  
Crane mechanism. J. R. Whittemore  
Crane. W. H. Richmond  
Crate for transporting poultry. F. M. Gault  
Crate. Shipping. F. Schurek, Sr  
Cream separator. J. W. Hinkley  
Cream separator. Centrifugal. E. W. Broomall  
Cross bearer. 4 pats. A. E. Ostrander  
Cultivator. H. S. Swanson  
Cultivator. Single row. H. S. Swanson  
Culvert. Road. W. Isham et al  
Current machine. Electric alternating. K. A. Lindstrom  
Current machinery. Alternating. A. S. McAllister  
Current motor. Alternating. M. Deri  
Current motors. Starting compensator for alternating. E. F. Gehrkens  
Curtain stretcher. F. M. Haynes  
Cut off. Automatic. E. G. & J. R. Rose  
Cut out. Transformer. J. P. Hetherington  
Dairy products. Suction apparatus for. C. M. Taylor, Jr  
Dental tool. A. W. Feltmann  
Desk table. H. Johnson  
Dial lock. L. A. Druehl  
Diamond. E. G. H. Schenck  
Dispensing device. G. L. Belcher  
Display case. Sample. A. Jelliffe  
Display device for millinery articles. H. Silberman  
Display hanger. G. D. Dial  
Display mirror. W. V. D. Kelley  
Dividers. Self centering. C. C. Amendt  
Door hanger. M. Cossey  
Door lock. C. F. Fringer  
Dough dividing and scaling machine. R. Hohnbach, Jr, et al  
Draft appliance. A. McNeil  
Drawing models and the like. Adjustable holder for. G. J. Darrschmidt  
Dredger sleeve. W. F. Bowers  
Dredges, excavators, and the like. Dipper for. W. Ferris  
Dress or skirt gage. I. M. Ronse  
Duplicating apparatus. 2 pats. B. Dick  
Duplicating apparatus. L. C. Neff  
Dust collector. J. R. Thurman  
Dye and making same. Violet. O. Bally et al  
Easel. G. L. R. Dahlberg  
Electric carrier. Overhead. H. M. Harding  
Electric carriers. Means for controlling overhead. H. M. Harding  
Electric cell. K. Tsukamoto  
Electric lighting arrangement for theaters and similar buildings. Emergency. F. Brand  
Electric meter. W. J. Lloyd  
Electric switch. Rotary. J. Dugdill  
Electrical conductor. Flexible. G. E. Schmidner  
Electrically operated portable drill. A. Pedersen  
Electroplating apparatus. A. W. L'Hommedieu  
Electrostatic influence machine. E. Thomson  
Elevator cage. Automatic dumping. W. J. Newman  
Elevator gate. G. D. Thompson  
Elevator safety device. J. R. Conley  
Elevator safety device. F. S. Payne  
Engine bed. F. W. Salmon  
Engine sparker and governor combined. Gas. D. F. Graham et al  
Engines. Automatic speed regulator for internal combustion. J. G. Callan  
Engines. High tension current distributor for internal combustion. L. J. Le Pontois  
Envelops. Manufacture of bottle. C. B. E. Henke et al  
Excavating machine. A. F. Huber  
Explosion engine. G. Petzel  
Explosion engine. Cam movement. P. K. Stern  
Explosive engine. Double acting. J. W. Kyle et al  
Eyeglass guard. C. Goodwin  
Eyeglasses and spectacles. J. Kovacs  
Fan and score card. Combined. W. Steel  
Fan. Oscillating electric. H. S. Brown  
Fare receipt register. Conductor's cash. W. W. Kay  
Fare register. W. W. Kay  
Fastening device. E. Wotzel  
Faucet. J. O. Beazley  
Fence. J. H. Brown  
Fence fabric. Wire. reissue. T. Litwiller  
Fence lock. Wire. G. W. Beyerle  
Fence post. O. F. Lidke et al  
Fertilizer distributor. C. Johnson  
File and binder for newspapers, &c. Combined. J. Wilson  
Filter. E. W. Roberts  
Fire escape. J. C. Covert  
Fire pot and grate. S. Knapp  
Fire resisting cabinet. W. V. Dick  
Fireproof conductors. Making. A. M. Lougee  
Fireproof wire. A. M. Lougee  
Fishing tackle. B. Waldberg

Punch and the time stamp. Combined. W. L. Lee  
Race course starting gate. Portable. M. Cassidy  
Racking apparatus. H. G. Miller et al  
Radiator. Independent steam heat. W. Holstein  
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Railway. Surface contact electric. G. H. McFeaters  
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Scale. Coin controlled. J. Lorentzen  
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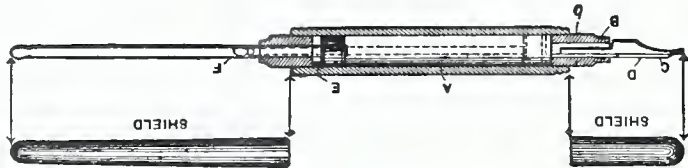
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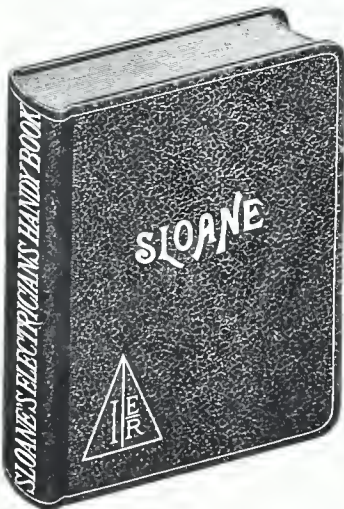
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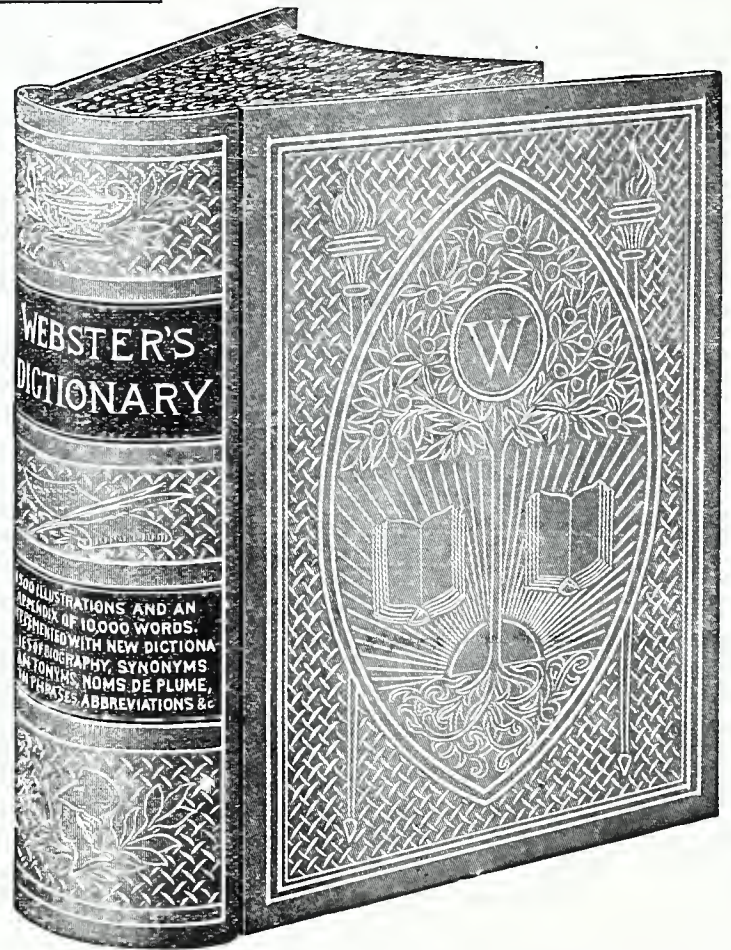
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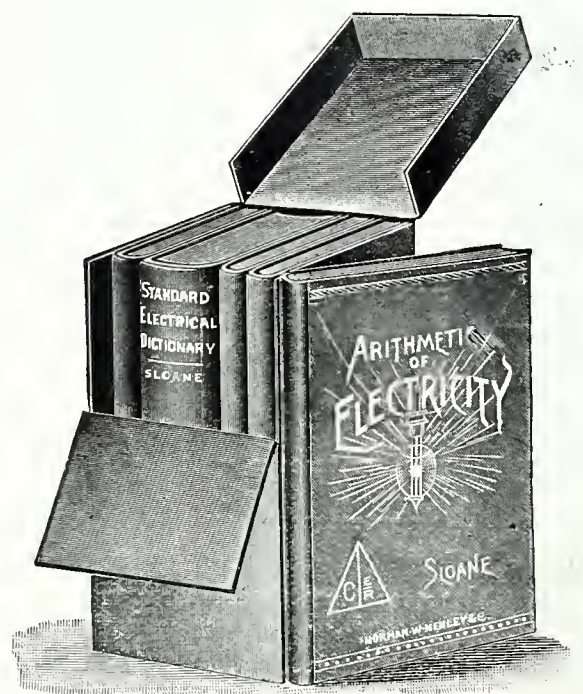
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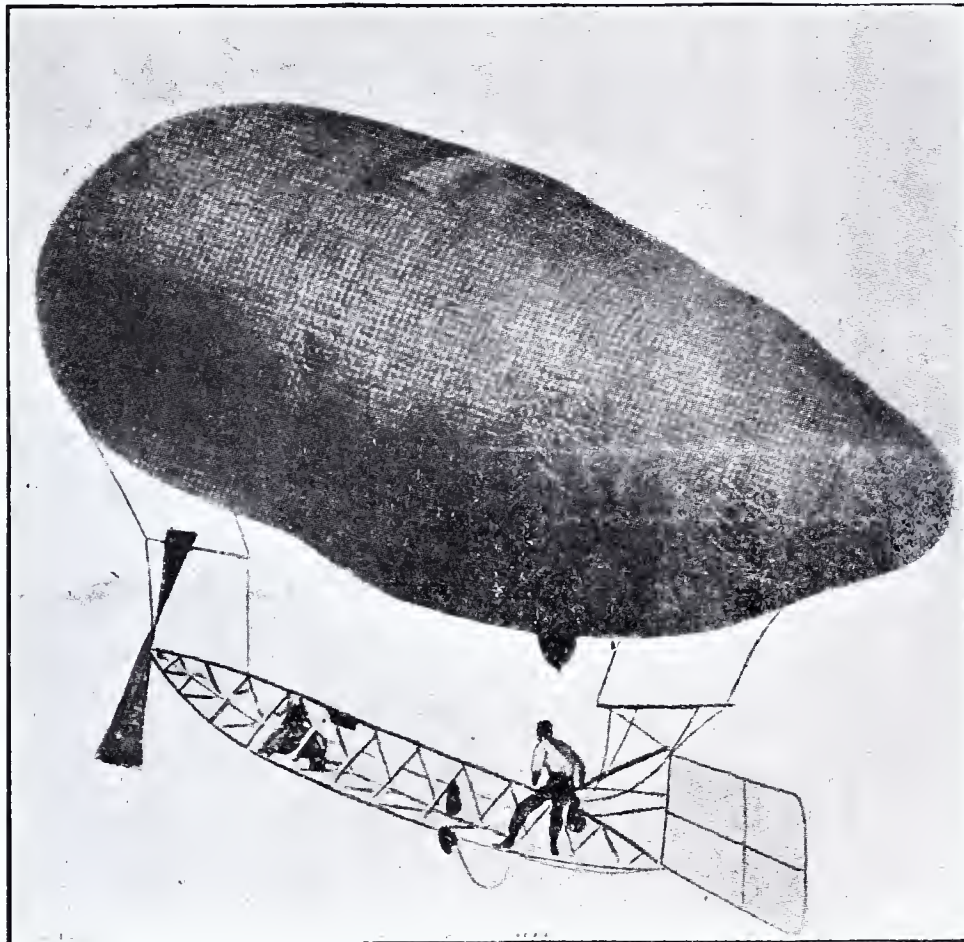
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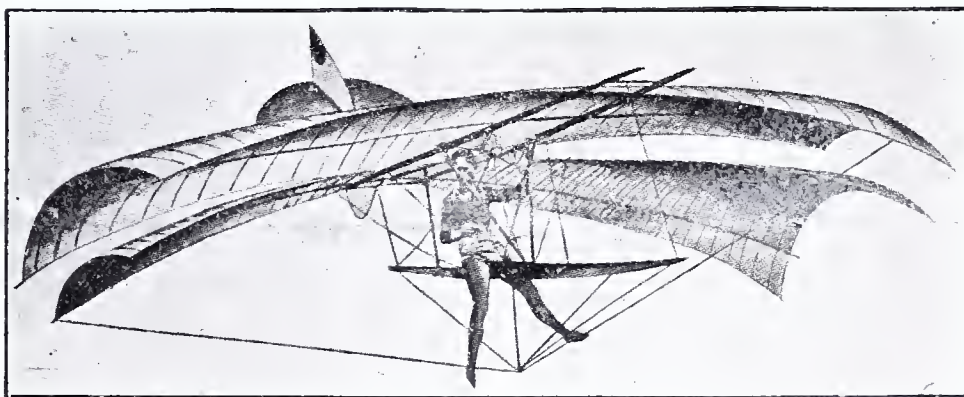
## PROGRESS IN AERIAL NAVIGATION.

THE successful experiments in navigating airships and balloons, in New York city, have brought vividly home to Americans the progress that is being made in this direction. It is true that the dirigible balloon used by A. Roy Knabenshue in his ascents, did not mark in itself any particular advance over the similar devices used by Santos-Dumont and others for years past. But it is one thing to read about achievements in Paris, or even experiments in California, and quite another to have aerial cruises witnessed by the inhabitants of our eastern metropolis. In fact, to the people of Manhattan—many of whom date a thing's existence from its first appearance in New York—these voyages assumed the proportions of a historical event. The eager excitement in which the whole city dropped its work, turned its collective face toward the sky, and stormed the Central Park lawns when the aeronaut descended, indicated the fame and reward that await the genius who shall put aerial navigation on a commercial basis. The illustration shows Knabenshue, in one of his dirigible balloons, rising in the air from the starting point in Central Park. The airship is 52 feet long and 16 feet in diameter. It weighs 200 pounds complete, and is supported by 7,000 cubic feet of hydrogen gas. The gas bag is of Japanese silk and weighs 75 pounds. The vessel is moved by a two bladed propeller in the bow, driven by a 10-horse power gasoline engine weighing 92 pounds.

It was in this machine that A. Roy Knabenshue made several fortunate ascents. Over the busy streets of the metropolis he took his huge egg shaped airship to a height of a quarter of a mile, and sent it whirling and flying through the ether like some great wingless bird, in any direction he wanted. Nevertheless, in spite of his success, Knabenshue is on record as declaring that the problem of aerial navigation is not to be solved by the balloon. Leader in aeronautics as he is, he thinks that it is through the aeroplane that practical results will be achieved, and the question of flight placed upon a commercial basis.



THE KNABENSHUE BALLOON.



THE MONTGOMERY AEROPLANE.

This testimony from the most expert of our balloonists makes doubly interesting recent trials of aeroplanes, that are reported to have been more successful than the unfortunate Langley machine. In fact, the achievements of Professor Montgomery, of California, are stated to represent the greatest single advance ever effected

in the history of navigation of the air. The hardest skeptic concerning the practicability of this line of effort, even among engineers who are noted for conservatism, would have believed in the aeroplane had he witnessed the recent experiment at Santa Clara. This aeroplane—an illustration of which is given herewith—consists

primarily of two silken wings, 24 feet long and 6 feet wide, stretched over a framework of hickory and piano wire. These wings are placed parallel instead of end to end, while in addition to the wings, which are curved on their under sides, there is a rudder, arranged to act both in horizontal and vertical directions. The weight of the entire construction is but 42 pounds. "The nerve of the professional aeronaut," declares an eye witness, "who, seated on this seemingly flimsy apparatus, launched himself from a balloon at an altitude of 4,000 above the earth's surface was as remarkable as the success that attended the hazardous attempt."

The aeroplane was lifted by a balloon—an ordinary hot air device. The aeroplane was attached to it by cable, much in the manner of the parachute-jumper's equipment. The height attained before cutting loose was about 4,000 feet, as closely as could be estimated, and, after an initial drop of a few feet, the aeroplane settled to, leisurely floating through the air, in the manner of a great soaring bird. It circled about at the will of the operator, manoeuvred to right and left many times, and on several occasions made long downward swoops terminating with shorter upward sweeps, by movement on an upward incline, in the teeth of the light wind that was blowing. It was impossible, of course, to rise higher than the altitude of 4,000 feet from which the start was made, but what Professor Montgomery considers the first and most difficult of the three problems of the aeroplane—that of soaring at will—was conclusively solved.

The second problem of navigation, says the professor, is that of finding means for continuing the initial flight without the necessity for constantly descending, to secure horizontal advance. This he thinks is likely to be solved by the use of propellers, driven by a gasoline engine, to give the machine horizontal velocity and thus do away with the necessity for starting it at a greater elevation than it is desired to reach. The third problem is that of rising from the ground, and this, he declares, it will be time



enough to solve after the right motor is made to propel the right wings in the right manner.

The total surface of the two wings of the machine is only 185 square feet. In no sense, therefore, did the apparatus act as a mere parachute, the principle of its construction being solely that of the gliding aeroplane, which by moving horizontally at great speed secures a sufficient support from the air beneath it to keep it from falling.

These experiments make the practicability of the aeroplane as a contrivance operated by gravity and the sustaining effect of air currents, and controlled by a man, a matter that can no longer be questioned. An aeroplane is sustained in the atmosphere not by a buoyancy due to its weight being less than that of an equal cubic quantity of air, but by presenting approximately flat surfaces to the air beneath them, new air being reached by onward movement faster than any tendency to settle, can act. In this respect, an aeroplane acts like a skater going over thin ice, which would break if he stopped, but as long as he moves rapidly will hold him up. In the case of the Montgomery machine, which weighed 42 pounds, the total weight, including the occupants, was 192 pounds. This weight was carried by wings of a breadth that made the supporting capacity about one pound to the square foot. This supporting capacity is sufficient to permit of very stout construction, and the promise of the aeroplane is that even greater weights can be carried when it is driven at higher speeds by motor propulsion.

Another airship with which remarkable results have been achieved in France is in the nature of a magnified kite, whose spread surface offers enough resistance to overcome gravity and keep it in the air. It is intended eventually to have a device that will generate enough power to lift this machine off the ground, and give it the start a boy gets for his kite when he takes a run before sending it aloft. But at the time of the recent experiments this had not been finished, and it was necessary to have recourse to outside means to get the machine into the air. As the trials were made over the river Seine, a motor boat was pressed into service. At the given signal, the boat was started at full speed, and when it had gone but a short distance, the aeroplane began to respond to the pressure of the air on its huge side, and gradually rose. Freed of its fastenings, it shot up into the air diagonally to a height of about 300 yards, when the driver cut a series of extraordinary manoeuvres, turning quickly, mounting, descending, going in gradually widening curves and taking all sorts of sudden shoots. After an exhibition that lasted a quarter of an hour, and proved that he had the machine under perfect control, the aeronaut allowed it to gradually descend. In the test, every promise made by the inventor had been fulfilled, and no less an authority than Santos-Dumont did not hesitate to offer congratulations.

Still another aeroplane that is

attracting attention has been built in this country by G. C. Gillespie, and is said to embody principles which impart to the operator the capacity to adapt himself to the atmosphere with almost the aptitude of a bird. Defective equilibrium, Mr. Gillespie thinks, sums up all the failures in flight which have beset the careers of so many structures of this type. The main reasons for the insignificant result of experiments with the aeroplane thus far, he attributes to the circumstance that it has never been possible to study it in action. Shifting the weight of the operator to vary the angle of incidence, and numerous devices to accomplish the same object—all theoretically correct—have been found to fail when put to the test. The new machine is to be propelled by seven aluminium propellers, each a little more than three feet in diameter. The power is furnished by an air cooled gasoline engine. The dimensions of the machine are 24 feet over all with a beam of 10 feet, the plane being of light duck, its surface being cut into at each end to provide for aluminium movable planes in order to vary the angle of incidence. To do this, they are connected by light wire cables with an aluminium wheel directly in front of the operator, and this is his sole duty while in the air, upon this fact being based ability to emulate the sub-consciousness of a bird in flight.

The exact form of flying machine that will command the market of the future is not yet known, but the practicability of locomotion in the air is being daily demonstrated. Mr. A. Roy Knabenshue has announced his intention of beginning to build flying machines to order. "I know," he remarks, "that there are numbers of people who wish to have airships of their own. I expect that the airship will soon take the place now held by the automobile in popular estimation, as the automobile succeeded the bicycle."

#### ELECTRICITY FROM GARBAGE.

Also a By-product that Yields Bricks and Paving Blocks.

A plant was recently erected at Zurich, Switzerland, for disposing of the city garbage by burning, the heat engendered being utilized to manufacture electricity. The plant is located in the outskirts and contains twelve furnaces, which are capable of burning 125 tons of garbage in twenty-four hours. The wagons loaded with garbage are lifted by means of a derrick upon a platform above the furnace into which the garbage is dumped. As garbage, however, does not burn easily, an electric blower injects a strong current of air which has been heated by passing through flues in the furnace walls.

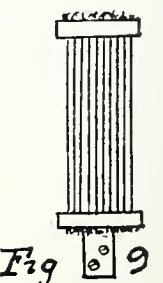
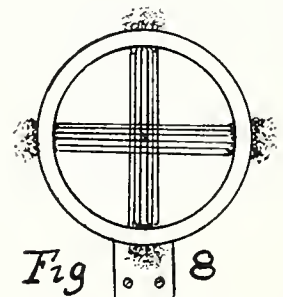
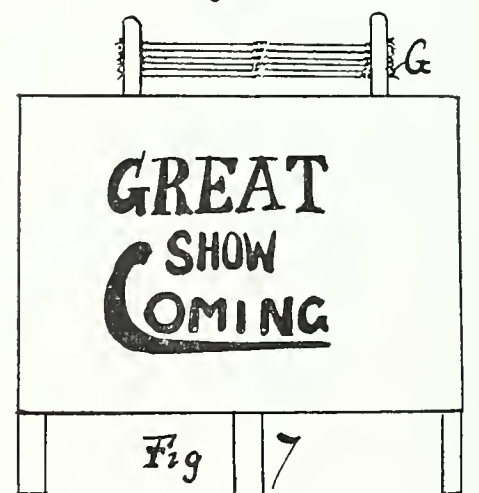
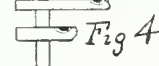
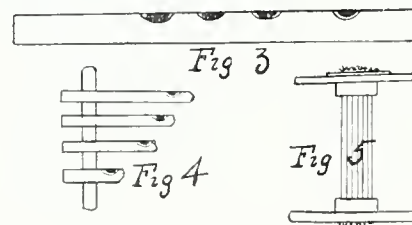
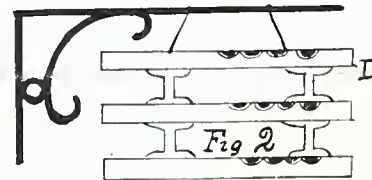
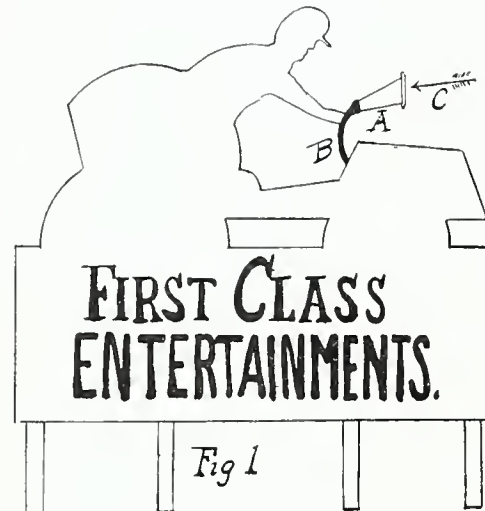
The heat engendered is sufficient to make steam, which is used in the usual way to operate the dynamo. The electric power produced is used first for the purpose of the plant and to supply part of the power of the electric railroads of the city. Complete combustion of the garbage does not take place. From 30 to 40 per cent of its original weight remains in the form of slag. This slag, by mixing with lime, is used for making bricks and paving blocks.

#### MUSICAL KITES AND BILLBOARDS.

The use of music as an advertising medium is as widely known as the circus parade. The graphophone and the mechanical piano player have become as familiar for this purpose, of late years, as the hand organ or the wheezy accordion which the street beggar employs to attract attention to his infirmities. Nevertheless, in view of the eager search for novelty in advertisements and of the proverbial influence of music upon humanity, it is strange that the latter has not been more generally utilized. Our sense of sight is constantly appealed to: flaring posters cover the walls of our cities; huge advertisements mar the beauty of our mountain cliffs. One hardly

large in size so as to present a free passage to the winds. This horn is adjusted so that whenever the wind blows in that direction, the air currents enter the opening *C* and pass through the horn *A* to the rubber tube *B*. By means of this tube, the air is conveyed to a music producing device, which consists of the usual cluster of tubes, arranged on the plan of a harmonica. The shifting wind and the fluctuations in the draft cause variations in tone, with a resulting musical effect that is really worth listening to. It may be thought that the music will be produced only when the wind comes from the right direction: but it is intended, by means of a pivot, to permit the horn to turn like a weathercock, and receive the air currents from any direction. The board itself is of course decorated with any advertising matter that may be desired.

In Figure 2 there is illustrated a common form of musical device, which may be attached to any bill board. This, like the one above described, is an American invention, and while it cannot as yet be purchased ready made, it can be constructed to order from the plan. Three common types of musical tubes are arranged in hori-



dares begin reading a paragraph with an interesting title in a newspaper, lest it should end in an appeal to try Somebody's Sure Cure. Even the heavens bring no rest to the eye: they are dotted with banners, kites and balloons, with inscriptions that can be read a quarter of a mile away. But the sense of hearing has heretofore been relatively neglected. There are signs, however, that this omission is about to be repaired. The musical billboard is the latest novelty.

The passer-by hears a humming sound, which seems to come from the clouds. He stops, looks about, and traces the tones to a billboard, designed, say, like that shown in Figure 1 of the accompanying illustrations. Various other forms will readily offer themselves to the imagination, but the one in question is made to represent an automobile with its chauffeur, in profile. This is done by simply sawing the design from boards, the separate pieces being cleated together on the back.

Fixed to the headpiece and in proper position for the horn is a real sheet metal horn, made somewhat

zontal order, one above the other, connected by means of brackets, and the whole swung to a metal support, as shown, which is fixed to the billboard frame. These tubes may, in fact, be common forms of whistles, but they should be of the "soft" kind that



are easy to blow. When the tubes are arranged as in the diagram, the wind plays into them as at *D*, and the whistling produced is sufficient to attract general attention.

One of the best forms of tubes is shown in Figure 3—a common tin tube, with air holes as represented. These tubes can be had ready for use in many of the musical instrument stores. A method of fastening the tubes to the frame, for the purpose of obtaining varying tones, is indicated in Figure 4. This consists in arranging the four tubes one above the other, the lengths being graduated so that the shortest tube is at the base. As the air plays into this instrument, each tube produces its particular tone, resulting often in an unique musical effect that can be heard a considerable distance away, especially on a still day. Sometimes the harp string plan is used, as shown in Figure 5. This is done by using two metal bars, each about 20 inches long; the fine wires are stretched between as illustrated. This design is affixed to the top of the bill board, (see Fig. 7) and the wind currents produce most harmonious tunes as they pass through the wires.

This last idea was probably derived from the musical advertising kite of the Chinese. It seems strange that a new idea should come to us out of the effete East, but both in China and Japan, these kites have been in use for years. One of these musical kites arranged for American service is presented in Figure 6. The kite is provided with projections at the base, and the wires are stretched between these projections, as at *F*. The kite, decorated with the required advertisement, is launched upon the air, and when it attains the proper height, the winds play on the wires, and the vibrations cause music that can be heard a long way off.

Other forms of the same device are shown in Figs. 8 and 9. The circular one—which varies from 20 to 36 inches in diameter—presents opportunities for greater variation in tone, as more wires can be used. Piano wires are generally employed for this purpose and as this can be bought at reasonable prices, the actual cost of these musical advertising devices is very small.—*The Traveller*.

#### Incandescent Gas Mantles.

Of the many people who use incandescent mantles for gas jets, few know what is the nature of the material of which they are composed. This curious gauze-like substance, like the flaming bush, burns without being consumed. It really consists of a kind of earth—thorium by name—which is very rare, and is found in workable quantities only in monazite sand. This sand has heretofore been obtained from Brazil, and of course, in these days of trusts, it has been in the hands of a monopoly. The monazite has been sent to chemists in Germany, who sold it to the Thorium Convention. Two or three years ago, the price of the earth was about \$4 a pound; later it rose to \$5, and now it is over \$6. Now, however, the monopoly is about to be broken. Monazite has been discovered in the Carolinas, and a company has been formed to extract it. Machinery for working the deposit has already been erected, and it is probable that these mantles in the future can be obtained at a reduced price.

### JAPANESE ON AMERICAN FARMS.

THE establishment of Japanese colonies in Texas for the purpose of developing the rice lands of the South has raised a general discussion of the question of Japanese immigration and naturalization. Indeed, it promises to become an important political issue. There is no question more vital to our country than the improvement of the class of immigrants who, year after year, flow in an ever-increasing tide into her dominions from beyond the Atlantic and the Pacific Oceans. How to divert these overwhelming masses from the cities to the agricultural districts, and what measures should be taken to better the material welfare of these alien peoples, are matters that demand the serious attention of our statesmen.

In connection with this problem, it is interesting to note that during the

the density of the population necessitated the division of the farm land into minute tracts, resulting in the development of intensive cultivation. Machinery is practically unknown on the farms of Japan: hand labor is employed, the implements being few and simple. They till the land with indefatigable toil and unfailing patience. On the wide prairies of America, although machinery is substituted for human force, the Japanese retain the characteristics inherent in their race, applying to our mode of extensive cultivation the fastidious dexterity acquired through generations of experience.

The first movement to colonize the Japanese in Texas was made by Mr. Uchida, Consul General of Japan in New York, who visited the rice belt in 1902 to investigate conditions. He

dustily, requiring irrigation for the fruition of the crops. Outside of the localities immediately interested, it may not be generally known that it was some years ago introduced into the United States, and is attaining considerable success. There are now some 600,000 acres under cultivation in Louisiana and Texas, besides a limited area in South Carolina and other Southern States: and the crop last year was estimated at over 600,000,000 pounds.

The accompanying illustration shows the process of sifting rice in Japan—a characteristic scene. Just at this time, when so much attention is being given to the study of the comparative strength of nations, and the leading national systems of productive efficiency, it is of interest to note the extent to which the Japanese have accepted the truth that the natural sciences lie at the basis of material development. It has been estimated that if all the tillable acres of Japan were merged into one field, a man traveling in an automobile at the rate of fifty miles an hour, could skirt the entire perimeter of arable Japan in



THE PROCESS OF SIFTING RICE IN JAPAN.

last two or three years there have appeared in the state of Texas, several Japanese colonies, whose aim is the growing of rice on lands of their own. As the time has been short since the Japanese commenced to till the soil in America, their colonies are not yet as well established, nor as characteristic of their native land, as the Russian colonies on the prairies of Western Kansas; yet the crops are excellent, and the prospects are such as to render the settlers sanguine.

As is well known, the Japanese are a rice-eating people. For countless generations they have subsisted on this staple, and naturally the art of rice culture has been developed among them to a degree of perfection unexcelled by any other nation. The geographical limits of the Empire and

addressed a meeting of the Rice Association of America at Beaumont, Texas, stating that it was not the intention to encourage the immigration of cheap labor, but that owing to the high price of land in Japan, it might be desirable to invite Japanese farmers of some means to settle in America. The association passed a resolution extending the invitation, and several parties have settled in the neighborhood of Houston, each working from 300 to 600 acres of rice land. Their capital is not large, ranging from \$5,000 to \$10,000, but such is their economy and frugality, that they have been able to buy land and heavy machinery and pumping engines on the installment plan, and the returns have been excellent.

Rice culture is an expensive in-

eleven hours. Yet upon this narrow freehold the patient diligence of the Orientals, with knowledge of the chemistry of the soil and the physiology of plants, have yielded results that have astounded the most advanced agriculturists of western nations.

#### Wood as a Food.

An inmate of an English workhouse writing to *The Times* (London) states that he has "discovered that common deal wood is a valuable food and medicine if cut small and eaten." Commenting on this, *The Lancet* (London), while expressing some doubt whether this may not be a clumsy attempt at a joke on the subject of the workhouse bread, is moved to remark that there is really no reason why, if the necessity arises, wood should not be employed as a source of food, since it consists chiefly of cellular fibre, which on suitable chemical treatment may be converted into sugar.

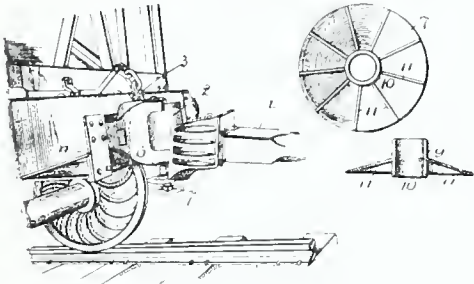


## CLEVER NEW PATENTS.

Car Coupling.—Vapor Burner.—Lawn Mower.—Water Filter.—Mold.—Music Leaf Turner.

### Car Coupling.

It has often happened that draw-heads of railway cars have become broken, and falling upon the tracks, have caused serious accidents. Mr. Erasmus R. Trammell, of Lakeland, Florida, has secured a patent on mechanism to prevent the dropping of draw-heads that are broken. As shown, the draw-heads are of any

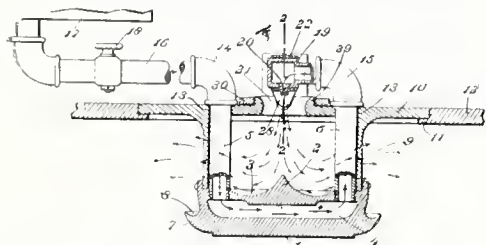


well-known form, and the knuckles are provided with depending pins 6, to which disks 7 of a peculiar form are fastened, (see the detail views at the right) these disks being so arranged that when the cars are coupled, a portion of each will be disposed beneath the head of the co-acting coupling member. Consequently should a breakage occur, the broken head will drop down upon the disk of the other head, and will thereby be held from falling upon the track.

The disk-like bracket is of such size or diameter that the bracket carried by one draw-head will lie adjacent to the bracket carried by the other draw-head, and as the edges of said brackets are very thin, one of the brackets may readily ride upon the other, incident to the swaying movement of the car and to the act of coupling or bringing the draw-heads together, thus preventing the edge of one disk from striking the other and causing breakage thereof.

### Vapor Burner.

A vapor burner designed more especially for burning crude oil or other hydrocarbon in a common range has been patented by Mr. Edward A. Franklin, of Austin, Texas. In place of the ordinary stove lid, a plate 10 is employed having depending brackets 9, and a central opening 21. Secured to the depending brackets is a vaporizer 1, and supply pipe 16 leading from a suitable reservoir 17 passes through the plate 10 and connects with the vaporizer. An outlet pipe 6 leads



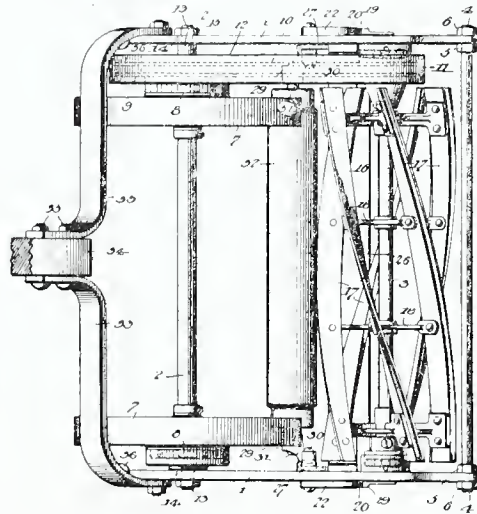
from the vaporizer upwardly through the plate 10, and has a downwardly extending discharge nozzle 20 that projects the vapor downward through the central opening 21 of the plate. The top of the generator or vaporizer 1 is in the form of a cone, as shown at 2, and a deflector 28 is rotatably mounted on the nozzle, so that the flame may be deflected from the vaporizer if desired. In action, the oil is fed through the pipe 16 into the vapor-

izer, where it is changed into vapor by the heat from the flame at the nozzle. This vapor passing upwardly is discharged downwardly again through the nozzle against the vaporizer, being burned at this point, and consequently maintaining the vaporizer at all times in heated condition.

A burner constructed in the manner shown and described is applicable to, and adapted to be successfully used in connection with cooking stoves and ranges of various sizes, the supporting-plate 10 being adapted to be supported in the griddle holes or upon the top plate of the stove, as the case may be. The heat may be easily regulated, and a very intense heat may be generated with a small consumption of fuel.

### Lawn Mower.

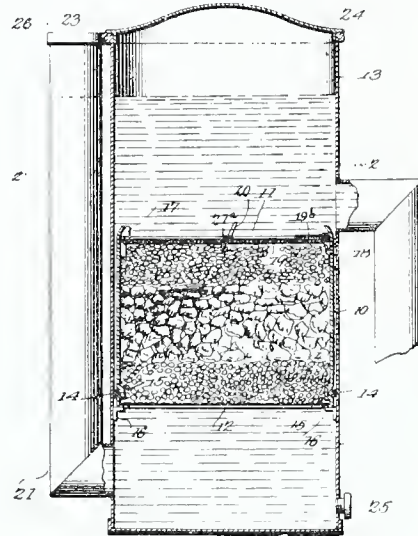
A new lawn mower invented and patented by Camden L. Wilcox, of West Williamsfield, Ohio, comprises a pair of side bars 1, to the rear ends of which are pivoted brackets 33 for the handle 34. Coiled springs (not shown) are interposed between the side bars and the brackets and serve to force the handles in an upward direction. The wheel shaft, or axle 2, is journaled to and between the side bars and carries the wheels 7. This shaft or axle is geared, as shown at 10, to the cutter shaft 3, journaled between the front portions of the side bars 1 and having ball bearings. Depending from the side bars in rear of the cutter are brackets 27, which are adjustable and have a gage roller 32 journaled therein. By the construction described, it will be seen that the handle-



carrying members, and consequently the handle, are normally sustained in a raised or elevated position, in which position the handle is ready to be grasped by the operator. When the machine is to be used, the handle of the machine is, in the act of pushing to propel the machine, naturally pressed against the tension of the springs, thus exercising a downward pressure upon the frame of the machine in rear of the main shaft or axle. This pressure will be gaged by the experienced operator in such a manner as to relieve the front part of the frame, and especially the roller 32, from excessive weight. The weight is thrown upon the traction-wheels, which will thereby be caused to grip or engage the ground with a greatly-increased degree of tenacity. It follows as a matter of course, that the machine will not be liable at any time to slip or slide over the ground, and that positive motion will, at all times, be imparted to the cutting mechanism.

### Water Filter.

A new water filter, which the inventor claims will thoroughly purify the rain water secured from the roof, has been patented by John H. Cox, of Erie, Kansas. The structure is unquestionably simple, and is one that can be readily cleaned. A casing 2 is employed having supporting ears 16 within the same. On these ears is placed a filter comprising a basket 10 having perforate top and bottom walls 12 and 13, and within which is placed suitable filtering material. A packing 14, carried by the basket, prevents the passage of water between the same and the casing. The inlet to the casing

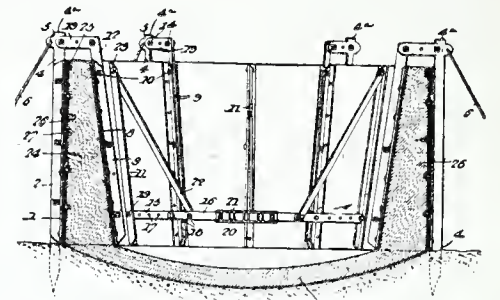


from the down-spout is shown at 21, and communicates with the lower portion of the casing below the basket, while the outlet 22 is connected to the upper portion of the casing above the basket. It will thus be seen that all water must pass upwardly through the filter before it escapes from the casing. Furthermore, as the basket can be readily removed through the top, the filtering material may be changed and cleansed, as often as found desirable or necessary.

### Mold.

A new mold for forming drinking tanks and the like from cement is a recent invention of Mr. Gustav A. Byor, a well known resident of Edgar, Nebraska. It is primarily designed to enable the convenient setting up of the mold upon the ground for the formation of a concrete or artificial-stone drinking tank, which is to remain in the position molded after the mold has been removed therefrom. Inner and outer members 8 and 26 are employed, and are disposed concentrically to each other. Each of the mold members is made up of flanged sections, and the flanges of each section are connected to the flanges of the adjacent section. Posts are driven into the ground in engagement with the outer mold member, and have their upper ends rising above the top of the mold. These ends are provided with arms

that extend inwardly. Inner posts are secured between the inner flanges of the inner mold member, and rising from the top of the mold, have out-

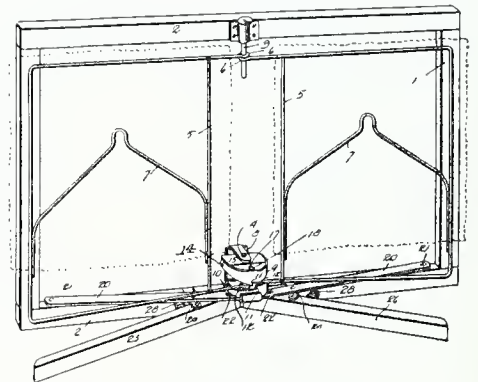


standing arms that lap the inwardly extending arms of the adjacent outer posts. A centering device is located within the inner mold member and is provided with a series of radial seats. Radial braces, engaging in the seats, extend outwardly to the inner mold sections, and inclined braces extending downwardly from the inner mold member, are connected to the first mentioned braces, thereby forming a powerful and rigid structure, which will withstand the pressure and strain incident to the manufacture of the concrete body.

In practice, the cement for the sides of the tank should be run into the mold before the bottom has become set, in order that there may be an intermingling of the cement of the bottom and sides of the tank to produce an integral structure.

### Music Leaf Turner.

W. L. Caywood and E. M. Steele, of Canon City, Colo., have secured a patent on means, whereby music leaves may be conveniently turned in either direction by the performer upon a musical instrument, such as a piano or organ. A perspective view of the structure is illustrated herewith. A plurality of swinging vertically movable leaf holders 5 are employed, each having a lower arm, the lower arms of the different leaf holders being ar-



ranged one above another; and associated therewith are upper and lower cam devices. These devices are mounted for simultaneous oscillatory movement in a horizontal plane, and the upper cam device is also capable of an independent vertical movement. Levers 21 are connected to the lower cam devices, and actuating levers 25, 26 are connected by links to the first mentioned levers, springs 28 being employed for pressing the free ends of the actuating levers outwardly. By operating these actuating levers, the leaf holders can be manipulated as desired.

## PATENTS, CAVEATS, TRADE-MARKS, COPYRIGHTS, AND DESIGNS. TWENTY-FIVE YEARS PRACTICE.

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## LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

### BOSTON PNEUMATIC POWER CO. v. EUREKA PATENTS CO. et al.

(Circuit Court, D. Massachusetts. 139 F. R. p. 29.)

#### PATENTS—INTERFERENCE—SUIT FOR ANNULMENT.

Rev. St. § 4918 [U. S. Comp. St. 1901, p. 3394], providing for suits to annul interfering patents, gives the court jurisdiction only to adjudicate between patents, the claims of which are substantially identical, and, where such identity is not shown, it cannot declare a later patent invalid for want of patentability.

### EASTMAN KODAK CO. v. ANTHONY & SCOVILL CO.

(Circuit Court, S. D. New York. 139 F. R. p. 36.)

#### PATENTS—INVENTION—PHOTOGRAPHIC FILM ROLL.

The Turner patent, No. 539,713, claims 1, 2, and 3, for a photographic film roll for daylight loading of a camera, consisting of a sensitized film mounted on a strip of opaque material, having markings on the back which can be seen through a peep hole in the camera to indicate when the film is in proper position for an exposure, and also to show where the film is to be cut to separate the exposures, the whole wound upon a reel with lateral flanges, from which it is unwound in the camera as the exposures are successively made, and rewound on a receiving reel, are void for lack of patentable invention in view of the prior art, merely ordinary mechanical skill being employed to adapt well-known devices and means to the accomplishment of a desired result, which had before been accomplished in substantially the same manner by substantially the same means, although not in precisely the same combination.

### WILCOX & WHITE CO. v. FARRAND ORGAN CO.

(Circuit Court, E. D. Pennsylvania. 139 F. R. p. 46.)

#### PATENTS—SUIT FOR INFRINGEMENT—LACHES.

A device relating to automatic music playing instruments was used generally by manufacturers of such instruments for more than 12 years after the issuance of a patent therefor without notice or objection from the owners of the patent, and in many cases without knowledge of it on the part of the users, and during such time large capital was invested in the business, and instruments embodying the device aggregating several millions of dollars in value were sold. Complainant, which was one of the manufacturers so using the device without right under the patent, became the owner of the patent some five years after it was issued, and continued the use of the device without marking the same patented or giving any notice of its alleged exclusive right to its competitors in business. Held, that it was estopped by its laches from maintaining a suit for infringement against another, who, in the meantime, had established the manufacture of instruments in which the device was used without knowledge of the patent.

### POPE MFG CO. v. H. P. SNYDER MFG. CO. et al.

(Circuit Court, N. D. New York. 139 F. R. p. 49.)

#### PATENTS—INVENTION AND INFRINGEMENT—BICYCLES.

The Smith patent, No. 392,973, claims 1 and 6, for an improvement in bicycles, which consists in building the transverse tube for receiving the pedal shaft rigidly into the frame, so as to form an integral part thereof, embody an invention of the patentee, and disclose patentable invention, in view of the prior art. Also held infringed.

### MILLER et al. v. WALKER PATENT PIVOTED BIN CO.

(Circuit Court of Appeals, Third Circuit. 139 F. R. p. 134.)

#### PATENTS—INFRINGEMENT—TILTING BINS.

The Walker patent, No. 614,279, for a tilting, pivoted, and counterbalanced bin, for store use, held not anticipated, valid, and infringed, as to claim 1, by two different styles of bin made by defendants, both operating on the same principle as that of the patent.

### SCOTT et al. v. FISHER KNITTING MACH. CO. et al.

SAME v. REGAL TEXTILE CO. et al.  
(Circuit Court, N. D. New York. 139 F. R. p. 137.)

#### PATENTS—INFRINGEMENT—KNITTING MACHINES.

The Bellis patent, No. 561,559, for improvements in knitting machines, consisting essentially of jacks or loopers, adapted to weave a supplemental thread into the fabric as it is being knitted to form a backing or a two-ply fabric, is not entitled to a broad construction, as covering a pioneer invention, the elements being essentially old in the art. As reasonably construed, it is not infringed by the machine of the Fisher patent, No. 656,533, which employs a device not the equivalent of such jacks, which operates in a different manner, and also produces a different fabric.

#### 2. SAME—CONSTRUCTION OF CLAIMS.

Where claims following the specification in a patent end with the words "substantially as described," the specification must be looked to in constructing such claims which may be thereby limited or qualified.

#### 3. SAME—INFRINGEMENT.

A patent for a machine, which is inoperative, cannot be broadly construed to cover a subsequent machine which is successful.

### DE LONG HOOK & EYE CO. v. FRANCIS HOOK & EYE & FASTENER CO.

(Circuit Court, W. D. New York. 139 F. R. p. 146.)

#### 1. UNLAWFUL COMPETITION—EQUITY—MISLEADING MISREPRESENTATIONS.

Where the printing on the back of complainant's card containing hooks and eyes did not claim that the hump feature was patented, but merely directed attention to complainant's articles by referring thereto as the "De Long Patent Hook and Eye," and contained a sketch thereof, with an index line pointing significantly to the hump or a spring tongue of the hook, such reference to a patent, which had been held invalid except as to the triple band of spring wire to strengthen the hook, did not constitute such a deception of the public as precluded complainant from relief in a court of equity against unfair competition.

#### 2. SAME—DRESS OF GOODS—CARDS—SIMILARITY.

V here cards used by complainant and defendant, containing competing hooks and eyes, which were attached thereto by thread, were substantially the same in size, color, and form, and, though the words printed on defendant's card were different, the style, printing, spacing, etc., were made to simulate complainant's card, as closely as possible, and defendant later simulated complainant's mode of fastening the invisible eyes to the card, though stitched in a different manner, defendant was guilty of unfair competition.

### REVERE RUBBER CO. v. CONSOLIDATED HOOF PAD CO.

CONSOLIDATED HOOF PAD CO. v.  
REVERE RUBBER CO.

(Circuit Court, S. D. New York. 139 F. R. p. 151.)

#### 1. UNLAWFUL COMPETITION—DECEPTION OF PUBLIC—INJUNCTION.

Complainant and defendant both manufactured rubber hoof pads so similar in appearance that a purchaser would hardly distinguish the one from the other, both being adapted and applied to the same use. The pads were sold in sharp competition, and there was evidence that defendant's pads were inferior to complainant's, and were sold at a less price. Complainant's predecessor first began making the pads under the firm name of "Air Cushion Rubber Pad Company," and the pads became known as "Air Cushion Pads," and as "A. C. Pads." After complainant's pad had been patented, defendant began the manufacture of its pads, on which is stamped the name "Air Cushion," and below used the words, "Consolidated Hoof Pad Co., 18 Vesey St., N. Y." and filed and registered the letters "A. C." as a trade-mark. Held, that defendant's acts in thus imitating complainant's goods constituted unlawful competition, which complainant was entitled to restrain.

#### 2. SAME—TRADE-MARKS.

Where complainant's hoof pads were made and on the market, and known as "A. C. Pads" to the trade, for a long time before defendant used the marks "A. C." on its inferior similar pads, defendant was not entitled to the exclusive use of the letters "A. C." on its pads by having subsequently registered such letters as a trade-mark.

### BOBBS-MERRILL CO. v. STRAUS et al. (Circuit Court, S. D. New York. 139 F. R. p. 155.)

#### 1. COPYRIGHTS—SALES—RESTRICTION—NOTICE—EFFECT.

Where the publishers of a copyrighted book printed a notice on the page following the fly leaf that the price of the book at retail was \$1 net, and that no dealer was licensed to sell it at a less price, and the sale at a less price would be treated as an infringement of the copyright, such notice did not purport to reserve to the publisher any interest in the book, or any right to control it or the action of its owner in the use and disposition thereof, and was insufficient to constitute a license agreement or contract restricting or modifying the absolute title acquired by purchasers.

#### 2. SAME—INFRINGEMENT.

Where a publisher of copyrighted books voluntarily parted with all control over them by selling the books to purchasers, such purchasers were neither licensees nor agents of the publisher, though buying the books for resale, and hence such resale did not constitute an infringement of the copyright, under Rev. St. § 4964 [U. S. Comp. St. 1901, p. 3413], declaring that it is an infringement of a copyright to print or publish a copyrighted book without the consent of the proprietor given in writing, or knowingly to sell or expose for sale a copy or copies of such copyrighted book when unlawfully printed or imported, though the books so sold each contained a notice that no dealer was licensed to sell it at a less price than that fixed by the publisher, and that a sale at a less price would be treated as an infringement of the copyright.

#### 3. SAME.

The act of a publisher of a copyrighted book in putting it on the market and selling it does not constitute a license to the purchaser to use and sell the same, which the publisher is entitled to restrict by a notice brought to the attention of the purchaser that the sale of the book at retail for less than the price fixed by the publisher shall be considered an infringement of the copyright.

#### 4. SAME—COMBINATIONS IN RESTRAINT OF TRADE—INTERSTATE COMMERCE.

Where the publishers and booksellers of the United States organized two membership associations, one known as the "American Publishers' Association," and the other as the "American Booksellers' Association," and together controlled the publication and sale of at least 90 per cent, of all copyrighted books, the objects of which were to compel owners and dealers of such books to purchase them of the members of the combination at an arbitrary price fixed by it, regardless of the actual value of the books as determined by a demand in an open market, or the condition of the books, and to compel all publishers and dealers of such books to come into the combination, to be controlled by it, and sell books at prices fixed by it, regardless of the value of the books or of the exigencies of the trade and situation of the seller, or be deprived of the privilege of purchasing, owning, and selling such books through a system of blacklisting, etc., the effect of which would be to cripple the business of any publisher or bookseller outside of the combination, such agreement was a violation of the Sherman anti-trust law (Act Cong. July 2, 1890, c. 647, 26 Stat. 209 [U. S. Comp. St. 1901, p. 3200]), declaring that every contract, combination in the form of a trust or otherwise, or conspiracy in restraint of trade or commerce among the several states is illegal.

### SCRIBNER et al. v. STRAUS et al. CHARLES SCRIBNER'S SONS v. SAME. (Circuit Court, S. D. New York. 139 F. R. p. 193.)

#### 1. COPYRIGHTS—BOOKS—SALE—RIGHTS OF PURCHASERS.

Where defendants purchased copyrighted books, some from complainants at retail, for which full retail prices were paid, which defendants sold at retail at a loss, and other books were purchased of dealers who had purchased from complainants and paid the full price demanded, and there was no notice given by complainant, either to defendant or to the dealers, restricting or limiting the title conveyed, defendants legally acquired the full title to the books purchased, and were not liable for infringement of copyright by reason of the sale of the books at a less price than that fixed by complainant under an alleged restriction, fixing the price at which the books should be sold at retail, of which defendants had notice.

#### 2. SAME—RESTRICTION OF SALES.

The following contained in catalogues and bills for books sold rendered to the purchasers for sale at retail: "Copyrighted net books published after May 1, 1901, and copyrighted fiction published after February 1, 1902, are sold on condition that prices be

maintained as provided by the regulations of the American Publishers' Association"—does not constitute a limitation or restriction of the title to the books.

### VON FABER—CASTELL v. FABER. (Circuit Court of Appeals, Second Circuit. 139 F. R. p. 257.)

#### 1. UNFAIR COMPETITION—FRAUDULENT USE OF NAME.

Defendants having the undisputed right to use the name "Eberhard Faber" on their goods, are not chargeable with fraud constituting unfair competition because of the use of the name "E. Faber."

#### 2. SAME—SUIT TO RESTRAIN—RIGHTS GOVERNED BY CONTRACT.

The parties entered into a contract to settle their respective rights with respect to the use of the name "Faber" on lead pencils made and sold by them, which provided that "the firm of Eberhard Faber [defendant] binds itself to stamp all manufactures connected with lead pencils \* \* \* not without first name, or at least with the initials of the first name." Defendant afterward used the name "E. Faber" on its goods as it had previously done. Held, that the use of such name was not in violation of the contract, but, even if so, the remedy of complainant was by a suit for its enforcement, or an action to recover damages for its breach, and that he could not ignore the contract and maintain a suit for unfair competition.

### CARY MFG CO. v. DE HAVEN. (Circuit Court of Appeals, Second Circuit. 139 F. R. p. 262.)

#### PATENTS—DAMAGES FOR INFRINGEMENT—BOX-STRAP REEL.

A decree awarding nominal damages only for infringement of the Cary patent, No. 403,247, for a reel for metal box-strap, affirmed on evidence showing that the reel was of slight value or utility; that in selling box-strap both complainant and defendant mounted the coils upon reels for which no charge was made; and that the strap was salable independently of the reels.

### WESTINGHOUSE AIR BRAKE CO. v. NEW YORK AIR BRAKE CO.

(Circuit Court, N. D. New York. 139 F. R. p. 265.)

#### 1. PATENTS—DISCLAIMER—CONSTRUCTION AND EFFECT.

A disclaimer filed under Rev. St. § 4917 (U. S. Comp. St. 1901, p. 3393), cannot validate a claim of a patent except as to something of which the patentee was the inventor, and which was "a material and substantial part of the thing patented." A claim too broad in its terms cannot be rendered valid by a disclaimer of all except a particular form of construction which may or may not have been embraced in the broad language of the claim, but which, if so, was not in any way specified or suggested therein as distinguished from other forms of construction.

#### 2. SAME—ENGINEER'S VALVE FOR CONTROLLING AIR BRAKES.

The Westinghouse and Moore patent, No. 401,916, for an improved engineer's brake valve, claim 7, is void, as too broad in its terms, and was not rendered valid by the disclaimer filed June 13, 1902. Also held not infringed, conceding its validity.

### O'LEARY et al. v. UTICA & MOHAWK VALLEY RY. CO.

(Circuit Court, N. D. New York. 139 F. R. p. 330.)

#### 1. PATENTS—VALIDITY AND INFRINGEMENT—CONVERTIBLE CARS.

The O'Leary reissued patent No. 11,992 (original No. 664,890) for convertible cars, having sliding window sashes and panels in the sides, removable at will, so as to convert the car from a closed to an open one, or from an open to a closed one, discloses patentable invention, and is of a pioneer character. It covers, by the term "convertible car," cars which are semi-convertible, in that the panels below the window sashes are not removable, as distinguished from those in which the sides are removable to the floor, so as to make a wholly open car, which can, if desired, be entered from the sides; the essential feature of the invention being the means by which the panels or sashes are moved to form an open car, and stored in a chamber within the roof while not in place. Also held infringed by cars constructed under the Brill and Bucknam patent, No. 709,073.

#### 2. SAME—INFRINGEMENT—ADDING NEW FUNCTION.

Infringement is not avoided by adding a new function to an element of a combination which does not affect its performance of the function of the patent.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured  
through the Patent Soliciting Office  
of E. G. Siggers, Patent Lawyer,  
Washington, D. C.

Andrew Olson, Cromwell, Conn. Stringed Musical Instruments.—This invention relates more particularly to zithers, auto-harps or similar instruments operated by means of plectrums. The object is to provide simple mechanism by means of which the different notes or chords to be played may be readily selected. The body of the harp can be of any desired or well-known construction, and located over the strings thereof is a casing having keys corresponding to the octave of a keyed instrument, such as a piano or organ. Novel mechanism located within the casing is operated by the keys, and in turn co-acts with the strings of the harp, so that by operating upon the keys, the different chords may be selected.

William Corfman, Sycamore, Ohio. Rural Mail Distributing Bag.—The device is particularly intended for use by rural free delivery carriers, and is of a nature to permit its use in connection with vehicles of practically any type. It is constructed of canvas or other flexible material, and comprises a backing sheet, on the face of which are formed, in a novel manner, sets of pockets to receive the mail to be delivered. Any number of these devices may be employed as desired, and can be hung, one over the other, in the vehicle, being removed as rapidly as emptied. By this means, the mail may be all sorted at the station, and the carrier has only to deliver it from the different pockets as he passes over his route.

Wilson J. Carroll, Columbus, Ohio. Lock.—This invention relates more particularly to permutation padlocks. Novel and simple mechanism is employed, which securely holds the shackle in locked relation against the attempts of a person, ignorant of the combination, to open the same. The mechanism is provided with visual and audible indicators, so that it may be operated in the dark as well as in the light. The locking mechanism is also an additional advantageous feature, for even when the shackle is released, it will not automatically open until operated in a certain manner, thus concealing the fact to an unauthorized person that the shackle is really unlocked.

Reinhold H. Paar, Carthage, Mo. Two patents. Bait Bucket and Watch Case Opener.—A very broad patent has been obtained for Mr. Paar on an exceedingly unique type of bucket. The bucket is provided with an imperforate lower portion and a perforate upper portion, and has a handle and a perforate cover. A perforate basket is slidably mounted within the bucket, and is normally located within the imperforate portion. Surrounding the perforate portion and vertically adjustable thereon is a ring float. This bucket can be placed in the water, and will be partially submerged so as to allow the circulation of water there-through. It can be lifted up and transported, whereupon the lower imperforate portion will hold sufficient water to keep the bait alive. By adjusting the float, the depth of submergence may be varied, and to secure a minnow, all that is necessary is to raise the perforate basket inside the bucket, whereupon the bait will all be caught, so that one can be readily secured.

The other patent covers an ingenious device for opening watch cases where it is impossible to unscrew the lids by hand. It may be applied either to the front or back of a watch

for removing either lid thereof. It is provided with a concave watch-receiving portion having an outer engaging peripheral portion. A recess is provided at the inner portion of the device to enable the same to clear the crystal of a watch. A yieldable lining is provided on the watch engaging portion, and is designed to be coated with rosin for enabling it to firmly grip the lid of a watch.

John T. Alexander, inventor; Joseph C. Messengale and Joseph A. McCord, assignees, Atlanta, Georgia. Combined Level and Gage.—The device of this patent is designed particularly for use on railroads in constructing and repairing the track, and it is adapted to be readily placed across the track on the two rails for indicating the proper gage or distance between the same. The combined gage and level is provided with an indicating device, which will enable a person, while jacking up a rail, to ascertain when the same is in proper position, thereby permitting this operation to be performed by one person instead of two, as has heretofore been necessary.

Allen C. Burner, Cass, West Virginia. Cider Mill.—It is the aim of the present invention to enable apples to be positively ground to any degree of fineness, and to discharge both the juice and the pomace at the bottom of the mill. The mill embodies a casing provided with approximately horizontal circular ways, having inclined top and bottom walls, and a horizontally disposed rotary element mounted in the casing, and provided with vertically movable grinding devices, arranged in the ways and actuated by the inclined walls thereof. The parts of the mill may be readily separated for cleaning, and they are adapted to be quickly assembled for operation.

Benjamin F. Childress, Lynchburg, Virginia. Adjustable Window Shade.—This patent covers a clever device for hanging window shades, and is adapted to be quickly attached to any window shade, whether large or small, permitting the window shade to be adjusted for covering any portion of a window, so that both light and air may be admitted at the top of a window, when desired. The fixture is provided with an operating cord having two branches, which depend from guide pulleys, located at opposite sides of the top of a window. One of the branches carries an extensible hanger, having means at its lower end for clamping the spring journal of a curtain or shade roller. The other branch is provided with a link having a terminal eye, and connected to the curtain or shade roller by a fastening device, which passes through the eye of the link and forms one of the branches of the roller.

Burton E. Clark, Allegheny, Pa. Machine for Making Sticky Fly Paper.—This machine is adapted to enable fly paper to be quickly manufactured and delivered in sheets, having their adhesive faces fitted against each other, and arranged in pairs, so that the sticky or adhesive compound will not interfere with the handling of the fly paper in packing and shipping, and will not be exposed until the fly paper is put in use. The machine is provided with means for applying the sticky or adhesive compound evenly to the desired portions of the surface of a continuous strip of paper and at regular intervals, so as to leave intervening or intermediate uncoated portions of the paper, and means are also provided for applying a border or marginal area of wax, or other suitable material, for surrounding the sticky or adhesive compound, and thus facilitate the separation of the sheets or members of each pair, and to provide a seal for preventing the adhesive compound from drying out through evaporation.

Frederick Warner, Gnadenbutten, Ohio. Hot Air Furnace.—This invention relates to hot air furnaces for heating buildings, and it presents an increased amount of heating and radiating surfaces. It embodies a tapered fire-pot, a cylinder body spaced from, and surrounding, the fire-pot, and a superimposed ring fitted against the body and provided with lugs, which rest upon the fire-pot. The ring is also provided with a flange fitting within and depending below the upper edge of the fire-pot and spaced therefrom. The furnace is provided with an ash-pit having an annular seat, on which is mounted a combined heating drum and radiator, which is closed at the top and which is provided with a series of projecting upright flues. The outer casing, which has an inner lining, surrounds the combined heating drum and radiator, and a draught tube or flue extends from the outer casing to the said ring at a point above the fire-pot.

William H. Gentry, Sedalia, Mo. Dust Box.—The dust box of this patent permits dust and trash to be swept directly into it by a broom, and it obviates the necessity of one person holding a dust receptacle while another sweeps the dust into the same. It forms a receptacle for dust and trash, and need not be emptied until filled. It consists of a box having a hinged lid, and a dust receiving platform hinged to the box and arranged to swing into and out of the same. Means are provided for connecting the dust receiving platform with the lid, whereby the platform will be swung into and out of the box by the opening and closing movements of the lid.

James P. Gordon, Florence, Colo. Two patents. Washing Machine and Excavating Machine.—The first patent covers a washing machine, which is provided with a rotary washing cylinder, and which will enable clothes or other fabrics to be conveniently applied to and removed from the cylinder, without removing the latter from the tub or casing. The machine is provided with a rotary washing cylinder, and a rubbing device arranged to engage the top of the cylinder. An arc-shaped apron embraces the lower portion of the cylinder, and is out of engagement with the same during the washing operation. Means are provided for bringing the apron into frictional engagement with the clothes for wringing the latter.

The second patent pertains to an excavating or ditching machine, which is capable of operating on ground wherever it is possible to drive a vehicle. It is worked by a stationery engine located beyond the place operated on, and it is provided with a combined draft and hoisting rope or cable, for propelling the machine and operating its scoop or shovel. After the shovel or scoop has deposited its load, and while it is returning to its starting point, its weight is utilized for actuating the means for conveying such excavated earth to a wagon or cart. The excavated earth may be discharged at any desired point within the limits of the movement of the carrying means, for conveying the earth from the scoop or shovel to the wagon or cart.

Levi W. Hamilton, inventor; B. A. White, assignee, Guthrie, Ky. Fertilizer Distributer.—It is the aim of the present invention to provide a hand-operated device, adapted to scatter fertilizer over the ground, and capable of enabling the quantity of fertilizer discharged at each operation to be readily controlled. This device comprises a hopper having a bottom opening, a removable collar fitted within the opening and adapted to be detached to vary the size thereof, a slide having an aperture to register with the bottom opening, and a spring actuated cut-off mounted on the slide for covering the said opening. The

slide is operated by a vertically movable bar, which is pressed against the ground, and which is provided with a foot to prevent it from sinking into the soil.

Hugh Harris, Galion, Ohio. Baking Oven.—The baking oven of this patent is especially adapted for baking bread, cakes, pies, and the like, in large quantities, and it is capable of affording a uniform heat of the desired temperature. The heat, after passing through the oven, is either permitted to escape directly to the chimney or flue, or is caused to pass around the exterior of the oven for further heating the same. The baking oven comprises an outer shell or casing, and an inner shell or casing, and it is provided with separate intervening spaces or passages between the said shells or casings. The inner shell or casing is provided at the top with openings, and has imperforate upright walls, while the outer shell or casing is provided with a heat escape. The said spaces or passages form a circuitous passage around the inner shell.

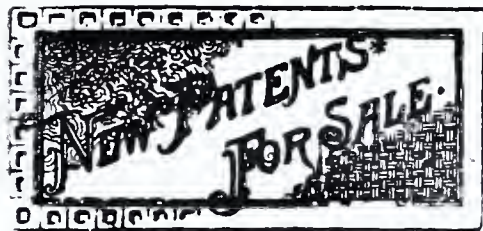
H. H. Kennedy, Downieville, Cal. Moth Exterminator.—The present invention is designed particularly for exterminating apple and peach moths and other insects injurious to fruit. It is hung out in an orchard, or other convenient place, and is capable of attracting moths and other insects, and of deflecting the same into a reservoir or receptacle, whereby such moths and insects will be destroyed. The device is adapted to support a lamp, and is provided with means for protecting the same from wind and rain, to cause the lamp to burn with a steady bright flame, and to prevent the reflector from being clouded by smoke.

Nicholas T. Leveritt, Paris, Texas, inventor; James Cameron, same place, assignee. Tire Tightener.—It is the aim of the present invention to provide a simple device adapted to be applied to a vehicle wheel by an unskilled person, and capable of effectively tightening the tire without straining the spokes, or dishing the wheel. The tire tightener consists of a curved clip, and an interiorly-arranged, transversely-disposed plate fixed to and carried by the clip, and having a tapered outer portion terminating short of the ends of the sides of the clip, to enable the latter to be bent inward around the ends of the felly sections between the felly and the tire.

Joseph J. Mally, David City, Nebr. Traction Wheel.—The wheel of this patent is designed especially for use as a drive wheel on traction engines, and it enables an engine of this character to operate effectively where the soil is soft and moist. The rim of the wheel is composed of inner and outer portions, spaced apart at one side of the wheel to form an annular groove or way, and the outer portion of the rim is provided with transverse spurs or projections, and has open spaces between the same, to permit accumulations to pass from the periphery of the wheel to the said groove or way.

Christopher Peacock, inventor; Joseph Peacock and John McCoach, assignees, Col. City, Col. Air Cooling Apparatus.—This patent relates to an air-cooling apparatus for use in residences, hospitals, and the like, to circulate a cool current of air either through a room or through any portion thereof; for instance, to a particular cot or bed in the ward of a hospital. It embodies a casing or cabinet provided with a lower ice compartment, and having upper air trunks extending from the ice compartment and located at opposite sides of the casing to form an intervening space. Fans are connected with the air trunks, and are provided with flexible tubes or conduits for conveying the cool air to the desired points.





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**FOR SALE** or on royalty—U. S. Patent No. 796,631. Jar Closure, issued August 8, 1905. Pacific Coast States reserved. Address, P. O. Box 273, F. O. Fischer, San Leandro, Cal. apr

**FOR SALE**—Patent No. 805,683, dated Nov. 28, 1905. State rights or county rights. Will let the right parties sell town rights on a liberal commission. Address, James B. Straight, Bates City, Mo. apr

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**FOR SALE**—Metallic self-spacing railroad tie. Patent No. 804,255, and Canadian Patent No. 94,062. Can be made at a reasonable cost. Will sell outright or lease on royalty. Address, W. A. Austin, Wayne, I. T. apr

**FOR SALE**—Patent No. 803,338, dated Oct. 31, 1905. Instantaneous Automatic Water Heater. Positively the best invented. A home luxury. No dwelling complete without one. Will sell outright, state, or royalty. Address, J. G. Haas, Monaca, Pa. apr

**FOR SALE**—On royalty, or any good way. The handy gun, patented Nov. 14, 1905, No. 804,255. It takes well. In great demand. A rare opportunity. Investigate. Address, J. R. McAlister & Co., Hailesboro, N. Y. apr

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**FOR SALE**—J. S. Mayse wheel straightening machine. Patented September 19, 1905. Will sell by county or state, or outright, with retained royalty. Address, J. S. Mayse, Brady, Texas. mar

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**FOR SALE**—Patent No. 805,032, dated November 21, 1905. Swinging Gate, adapted when closed to be firmly locked in such position as to prevent hogs and cattle from opening it. Inexpensive to construct. Strong and durable. Address, Claude Siebring, George, Iowa. dec

**FOR SALE**—Patent No. 806,768, dated December 12, 1905. Locking Bolt Mechanism. Adapted to locking doors, covers or closures to boxes, cases, crates, etc. Easy to operate. Address, T. Henry Bauer, Middletown O mar

**FOR SALE**—U. S. Patent No. 789,369, and Canadian patent No. 94,945. Hay Baling Press. Light and easy to operate. Has been tested. Will sell one or both patents reasonably for cash. Address, W. D. Kelly, Kerrville, Texas. mar

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## The Struggles of Inventors.

The world has always been slow to accept devices for saving labor. Great discoveries have always been received with incredulity, and the path of the inventor has been beset with thorns. When Watt first made the steam engine practical, scientific people rose up all over the country to give expert opinions on the subject. These opinions make ludicrous enough reading in the light of modern knowledge, but they were taken very seriously at the time, and it is noteworthy that almost without exception they were exceedingly unfavorable to the new device. They were sure it could not succeed, some for one reason, some for another. One declared that the cohesive strength of iron was insufficient to do the work that Watt expected; another detailed an experiment he had made with an iron vessel which burst under the strain, thus proving that no boiler could be made strong enough to resist the expanding steam. A third was sure that if the engine was set to work, the weaker parts would all give way. But the prophecies of the scientists were nothing to the forebodings of the working people, who foresaw themselves thrown out of employment, and who repeatedly threatened to "do" Watt.

When, in 1845, it was announced in the papers that a man named Howe had invented a machine that could sew, every tailor gave a loud hoot of derision, the idea being deemed superlatively ridiculous. One knight of the shears said that no sewing machine could be made to work unless it could be made to sit cross legged. Comic poems were printed in the newspapers, and predictions volunteered that machines would soon be invented that would sweep the house from cellar to garret, run errands and tend to the baby when the woman of the establishment wanted to gad about. (The sweeping machines, it may be noted, have become a reality, and the telephone has dispensed with the necessity of errands.) But not a tailor in

America would look at the machine when Howe took it around to exhibit its workings, and they were unanimous in predicting its failure: it being clearly impossible that a machine could be made to do the work of human fingers.

When, about a century ago, Murdoch discovered that gas could be used for illuminating purposes, all Europe laughed. "How can there be light without a wick?" inquired one member of that grave and august body, the British Parliament. When the House of Commons was finally lighted with the new illuminant, the custodian of the building, who imagined that the gas ran as fire through the pipes, insisted that they be removed several inches from the wall to prevent the house from catching fire. The members at first touched the pipes with their gloved fingers and then smelled them to detect the odor of burned leather. Sir Walter Scott also made merry of the attempt to "illuminate London with smoke from a tar factory."

These are only a few of the instances that could be indefinitely cited. It was but a few years ago that the man who believed in aerial navigation was dubbed a crank. If you want to earn a similar appellation, you need only to invent something radically new. A million people who don't know what you are doing will rise up to jeer.

## Novel Advertising Devices.

No other subject so enlists the attention of the business world as does that of advertising. However diverse the aims and interests of business enterprises, they are a unit in their estimation of this agency. It is not strange that in the struggle to attract the jaded public attention, the prize should be to the ingenious, and that any novelty which seems to promise success should be welcomed with joy. Strenuous are the methods sometimes employed: artificial conflagrations, with subsequent sales at "prices below cost" are not unknown in dry goods stores; robberies, especially in the theatrical profession, are so common as to fail of their purpose. Free lunches, free rides, free concerts, are well known devices. Up-to-date department stores install moving staircases and engage musicians of considerable reputation in their effort to draw crowds. A man put into a hypnotic slumber is exposed in the window of a shop, to be viewed by the curious; in another, there is displayed a test of endurance, a pianist playing for twenty four hours without stopping. Cake walks, pie-eating contests, and beauty shows, also serve to allure the public. More novel is an ugliness show, to which resort has lately been made, and which has achieved a surprising success. It has been shown that many women are as vain of their unusual homeliness as are others of their beauty. A storekeeper in Chicago conceived a bright idea when he displayed in his window a collection of toilet preparations and one hundred shining silver dollars, with the notice that the money would be presented to the ugliest woman who would call for it in person within

two weeks. Before the expiration of the period 900 women had applied, and nearly all of them bought some of the beautifying lotions and pomades on being assured, by the polite shopkeeper, that they had absolutely no chance of winning the prize. The contest was then prolonged for two weeks longer, and 2,000 women called at the store, which did a thriving business. The prize was finally won by a servant girl who considered her face so past redemption that she scorned to buy any of the toilet articles, on receiving her hundred dollars.

Searchlights and biograph devices are used to entice the interest of crowds at night, and in this connection an incident occurred in New York some years ago, showing an audacity truly American. The *World* had been for a week exhorting its readers to watch the tower of its building at night, intending some elaborate scheme of self-advertisement. When the appointed hour came, the crowds were amazed and amused to read on the tower of the *World* building "Read the New York Journal," the words being thrown by means of a searchlight from the rival establishment.

The streets of our principal cities are enlivened by figures grotesquely clad, and carrying advertisements. A few years ago there was a procession, with a band of men dressed as Sunny Jim, to advertise a certain health food. Punch and Judy also drag their domestic difficulties onto the public thoroughfares, all to be adjusted, as the squeaky voice of Punch finally announces, by a bribe on Judy's part of some particular brand of coffee. Buster Brown, Cute Willie, Simple Simon, the Mule Maud, all of the characters with which the comic journals have made us familiar, are used for advertising purposes.

And not only is an appeal made to the sense of sight; our ears are likewise saluted, and this method of alluring the public, although not so generally employed as the other, bids fair to become equally popular. In another column of this edition will be found an account of a musical billboard, the possibilities of which will at once be obvious, and there can be no doubt that this agency will soon be employed by the enterprising advertiser.

Another device that is more generally used in foreign lands than on this side the water, is the "sandwich man." This does not mean a man who sells sandwiches, as would appear at first thought, but a man whose body is sandwiched between two placards which are used to announce anything that may be desired. Processions of these men constantly walk the streets of London, and are employed especially for proclaiming the entertainments offered by the theatres. The story is told of an old lady who had just come to London and perceived one of these men with the label "Sir Henry Irving as Becket." After staring at the wearer, from his dilapidated hat to his ragged shoes, she exclaimed, "Well, I've often heard of Irving, but I never did think he looked like that."

## Work of The Patent Office.

The report of the condition of work at the close of business Feb. 27, 1906, printed in the Official Gazette Mar. 6, 1906, shows an increase in the total number of applications awaiting official action. The number is now 18,860, including new applications, as well as old applications which have been amended to avoid the objections of the Patent Office and returned for further official action. Under the new order of things, amended cases are given the precedence in order of action, with the result that actions on new cases have suffered. On the whole though, the present condition is much more satisfactory than what has obtained in the past, when an effort was made to give an early first action, thereby entailing delay in the future actions on the applications. The AGE has repeatedly commended the present rule, and is pleased to note that its operation has justified the predictions of this paper, and that there is less complaint now than before concerning the work of the Patent Office.

Of the amended cases, or those applications which have been once acted upon and returned to the Patent Office for further action, there are ten divisions of the Patent Office which are 15 days behind in considering this class of cases; fifteen divisions are 1 month in arrears; eleven divisions are between 1 and 2 months; one division between 2 and 3 months, and one between 3 or 4 months.

Of the new cases, two divisions are considering new applications filed in June 1905; two divisions are considering applications filed in July; four are considering applications filed in August; five have under consideration applications which were filed in September; two divisions are acting on applications filed in November; six are up to December in their new work, and nine are passing on new applications which were filed in January.

While we believe that in most divisions there is an earnest desire to catch up with the work, the conditions could be improved if certain principal examiners of the Patent Office would suppress the tendency of some of the assistant examiners to write essays when they render their official actions on applications. The official letters from some of the divisions could be cut shorter without relaxing in any way the necessary official statements. There are examiners who seem to think that it is a part of their duty to educate attorneys and applicants in the use of correct English and proper terms. The Commissioner has repeatedly held in published decisions that the applicant should be allowed his choice of words in the preparation of his specification and claims, so long as the meaning is made clear; and yet some examiners will frequently waste valuable time in discussing niceties in the shades of meaning between different words. We have in mind a case in which the Examiner wrote a nine page official letter on the second action. It probably represented several days of work and research. In a recent message, the President commented on the tendency of certain officials filling the government records with useless verbiage for no other purpose than to ventilate their erudition. We sometimes think that the President must have had in mind certain of our Patent Office friends.



### No Rewards Offered.

We cannot too often repeat the statement that the government offers no reward for perpetual motion, flying machines, hog cholera compounds, cures for consumption, or any other invention; and yet there is a very prevalent notion abroad among inventors that such is the case. Particularly is this true with respect to perpetual motion, for half of the inventors who have worked on perpetual motion, have done so because they felt that a reward was forthcoming. Once in awhile Congress has passed bills appropriating sums of money for investigation or research along special lines, and certain departments of the government have used their "contingent expenses" fund to make experiments in new inventions offered to them. Both the Navy and War Departments have done this. But we know of no standing reward for any invention. If an inventor chooses to waste his time in trying to solve the theory of perpetual motion, he should keep in mind the fact that he must expect his reward from the general public. All that the government offers on any invention is the award of a patent.

### Artificial Diamonds.

The production of artificial diamonds was the aim of alchemists in the middle ages, and in these modern days, chemists are still working to accomplish the same object. A diamond, as is well known, is merely crystallized carbon, and from time to time artificial gems have been made, but always at prohibitory cost—the experiments being more expensive than the value of the diamonds obtained, and being also very dangerous. In one instance, the laboratory of the experimenter was completely wrecked. A French chemist, M. Moissan, has shown a new method for producing artificial diamonds by the employment of molten iron as a solvent for carbon, and by using an electric stove for producing a degree of heat not hitherto reached. Through this intense heat, and by sudden cooling, the carbon is separated in the form of very small diamond crystals. A still further step in this direction has been taken by Dr. Burton of Cambridge, who has been able to produce the gems at a less pressure than that used heretofore.

In his experiments, the doctor used a molten alloy of lead and some metallic calcium, which can also hold a small quantity of carbon in solution. When the calcium is separated from the molten mass (which is accomplished through the agency of steam) a number of tiny crystals are formed, the properties of which are identical with those of natural diamonds. These artificial gems are pronounced the finest yet obtained in the laboratory, because they possess an unusually high power of refraction.

Sir William Brookes has recently called attention to a peculiarity of diamonds, namely that they are especially transparent for X-rays, while the imitation stones hardly let these rays pass through; this, he declares, furnishes an excellent means of distinguishing the genuine from the imitation gems.

### Model Office Appliances.

To facilitate work is the prime object of the new science of business. Labor-saving devices, modern appliances of various sorts, increase the efficiency of an office force beyond computation. Never in the history of the world has there been as much interest shown in office appliances as in the last few years. Invention has been at work contriving mechanical aids in office work until their number is legion. Not all of them, of course, are of practical benefit, but so many are really useful in general office work that it seems almost impossible to enumerate them.

The typewriter has now become an indispensable adjunct of an office which has any pretensions of being up-to-date. The benefits of the book typewriter are becoming equally well-known. The adding machine, the listing machine, and the computing machine (which is an adding machine that does not provide a list,) are beginning to be widely used by those business men who realize how much these mechanical devices add to the speed of their operatives, and how they provide a test of accuracy which cannot be questioned. The machine which makes percentages, for example, saves fully two-thirds of the time of a book keeper who has many averages to figure out.

One of the greatest advances in systematizing an office has been made in recent years in filing devices and card systems, the latter now being employed for thousands of purposes where a few years ago it would have seemed impossible. The vertical filing system which has advanced so rapidly of late is worthy of an explanation.

After filing letters flat for a number of years, and taking copies of manuscripts in a tissue book by a boy who spoiled both letter and copy in many cases, requiring the additional labor of indexing, it suddenly dawned upon some bright mind that more time could be gained, greater precision derived, and a more exact arrangement effected by taking carbon copies of answers to letters, attaching these copies to the letters, or making the copy on the back of the letter itself, and filing this correspondence on edge instead of flat. By the use of a pasteboard folder for each correspondent, which is properly indexed, the unit idea is preserved and the entire correspondence is placed in this folder consecutively, to be found all in one place when sought for. In order to produce tissue copying devices which would meet this requirement, rotary copiers have been invented which copy on continuous sheets, cutting apart the duplicates as required so that the tissue can be attached to the letter instead of the carbon copy. Some business men are much in favor of this plan on account of the fact that a carbon copy does not necessarily show changes which are made after the letter has been written, and it also lacks the signature of the party responsible for the correspondence—often a very important matter.

Of late years, the practice of billing on the typewriter has become so common that a special billing machine has been invented for this purpose,

which adds to the neatness of the work, and which, it is claimed, will save its cost in a very short time.

In the offices of factories which employ a number of traveling salesmen, routing map cabinets are used. These cabinets cover the territory occupied by the salesmen, and by an ingenious arrangement of tacks and string, the route of a man can be readily determined, the town where he is stopping shown plainly from day to day, and the succeeding towns on his trip laid out so that there can be no possibility of mistake. This is the modern commercial application of the system devised by Napoleon, for locating his armies. On his table there always appeared, during a campaign, a map of the territory covered, with red headed pins to represent the French forces, and black ones for the enemy. In the same way, the largest American business houses are organized in military fashion, the sales manager watching the moves of the enemy, as the nearest competitor is termed, and shifting his forces to meet them. A leading typewriter firm has the whole country thus charted, green tacks thus representing the salesman, yellow tacks the users of that particular make of machine, white tacks the stopping places of the agent, black tacks rival machines, etc. In this way the condition of the market in each state is shown by a glance at the map.

Office telephones are becoming almost a necessity. They are operated by means of a private exchange board, and serve to connect the different parts of a business establishment by communication much more prompt and efficient than a corps of office boys. The cost of maintaining a private telephone system is sufficiently balanced by its advantages for any house in which the departments are spread over much floor space.

Many large houses use the phonograph in place of stenographers, the practical little instrument being placed on the desk and being always at hand. Letters can be dictated to it as rapidly as needful without disturbing the typewriter, who may be at the same time copying correspondence from other desks. While this innovation has not come into general use, it has its advantages.

Among other inventions calculated to improve office work is the check protector, which has met with very ready favor, for the reason that a check cannot be raised if a good protector is used. Duplicating machines of various characters are found to be of great benefit, as form letters are frequently required at very short notice, and these machines are always ready to perform this work. In this connection, there are addressing machines which address envelopes so rapidly that one machine can do the work of several persons; and stamping and sealing devices, worked either by hand or electricity, at a speed which is almost marvelous.

One of the latest inventions is an outlook envelope; or as some persons facetiously term it, "peek-a-boo" envelope. This has a transparent window in its face, through which is shown the address of the letter, statement or bill enclosed, which saves addressing, at a relative cost of from \$1.25 to \$2 per thousand.

Autographic registers are very useful for the cashier or salespeople in stores, and are used in quantity by retail houses particularly. Automatic time stamps, which register the time of the arrival of mail or orders, or the time of beginning and ending of any performance in the manufacturing department, also have their value. Numbering machines, numbering automatically from one to one hundred thousand, used for various purposes and made to change each time, duplicate, triplicate or continuous as desired, have become almost indispensable. There are hundreds of patents on clips and fasteners, convenient and necessary. There are pencil

sharpening machines, the use of which it is claimed is paid for by the saving in pencils. There are money counters, counting all the metal money, automatically, perfectly, and with a speed of ten human counters. There are office "ticklers," keeping one posted in regard to engagements, delayed correspondence, new dates for accounts receivable and payable, and bills receivable and payable.

These are but some of the appliances which decrease labor and increase output; and though many of them may be classed as luxuries, they usually pay for themselves. A machine which saves 50 per cent of an operative's time, for instance, is worth to the firm one-half of the operative's wages. If these wages are only \$5 a week, it means an income from the machine of \$130 a year, 10 per cent upon an investment of \$1,300. Very few machines cost more than one-tenth of this amount. Machinery, in one form or another, has become as indispensable in the office as it has in the mill or factory.

### Theatre Fire Escape.

A novel—and it would seem, somewhat cumbersome—method of rescuing the audience of a theatre in case of fire has been invented by a native of Germany. Put briefly, the principle consists of the removal of the auditorium, en bloc, into the street, by means of rollers underneath the floor running over a track of rails continued to a suitable length outside the theatre, the scheme also allowing for the simultaneous rescue of the people in the balconies above by exits through specially constructed "window doors." These are so designed as to be opened automatically all at once, and they lead to suspended galleries which can be lowered by the same mechanism that actuates the movable pit. The inventor, by these means, aims to empty the theatre from orchestra to gallery within thirty seconds, whether the audience number two or twenty thousand.

The galleries of each balcony are described as being suspended on hinges from heavy outriggers, which act as powerful single-arm levers, and turn around on pivots fixed below the first balcony. On being lowered, all the outriggers and the suspended galleries move to the side and descend to the level of the street. The outriggers are fixed at their upper ends to wire ropes which run over a pulley on the roof through the lateral walls to the ground floor, where they are wound on rollers fixed rigidly to the side walls. As the outriggers descend, a transverse shaft is actuated through a conical-toothed gearing, and the racks fitted beneath the pit, as well as the pit itself, which runs on rails, are set in motion. The gearing is so actuated that at the moment the outrigger galleries touch the street, the whole pit has been removed from the building.

The apparatus is designed to be operated from an inclosed cabin, by means of a motor, on a fire signal being sent. The rescue of performers on the stage is also a feature of the scheme.

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 Stay release. Automatic..... L. P. Chute  
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 Telegraphic signals. Receiving..... S. D. Fied  
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Traction wheel..... F. E. Knight  
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Union coupling..... H. S. Crombie  
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 Vehicle seat. Auxiliary..... T. W. Parks  
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Washing machine..... T. C. Purves  
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 Water control system..... A. J. Collar  
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 Weaner. Cow, calf and colt..... W. T. Horne  
 Weed cutter..... J. Killifer  
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 Well device. Oil..... H. Wilson  
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 Wheel..... C. A. Binley  
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 Windmill regulating mechanism..... M. S. Newcomer  
 Window screen..... S. H. Garrett  
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 Glass dish..... J. M. McMahon  
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 Alarm..... W. L. Monroe  
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 Bottle rinser..... C. H. Loew  
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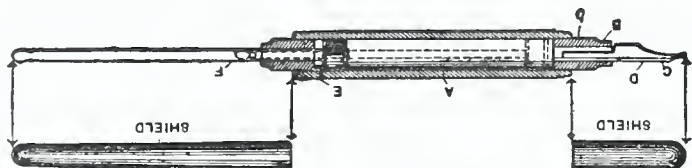
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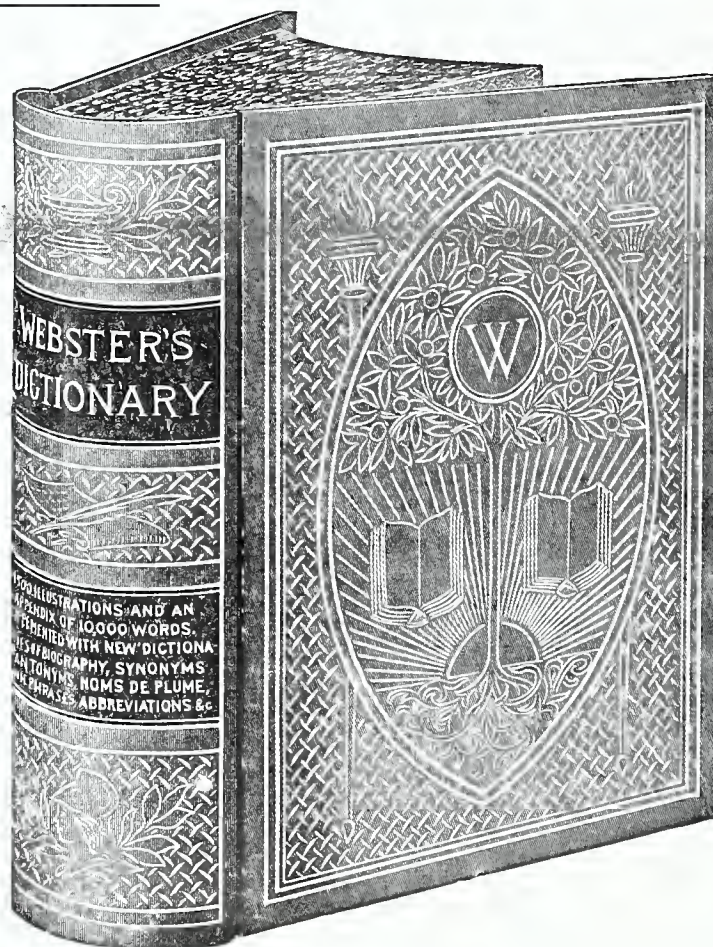
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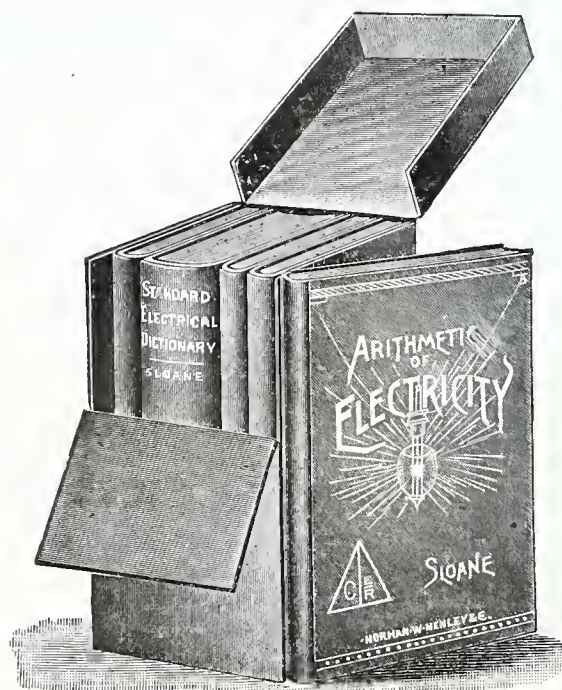


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## THE RISE OF THE AUTOMOBILE.

SIX years ago there were hardly more than sixty automobiles in the whole United States. It is estimated now that there are over 60,000, and all the other manufacturing countries of the world are turning them out with marvelous rapidity. France last year, for instance, exported more than \$14,000,000 worth—for the French machine is still the favorite of millionaires. On the other hand, we exported last year to the value of a half million dollars, and our machines are gaining in popularity at home on account of their adaptation to our special needs.

But the increasing uses to which the various styles of motor cars have been put during the last few years are even more important than their increase in number. From being the toy of the plutocrat, the automobile is growing to be the servant of the masses. Its uses for industry bid fair to outstrip those for pleasure.

hoists for loading and unloading heavy articles. They thus greatly reduce the toil of man as well as of beast. Most of the heavy freight trucks are run with electricity from storage batteries; but in the smaller centres, gasoline trucks are coming into use.

The delivery automobile is as useful and convenient as the truck for freighting purposes. Both the electric

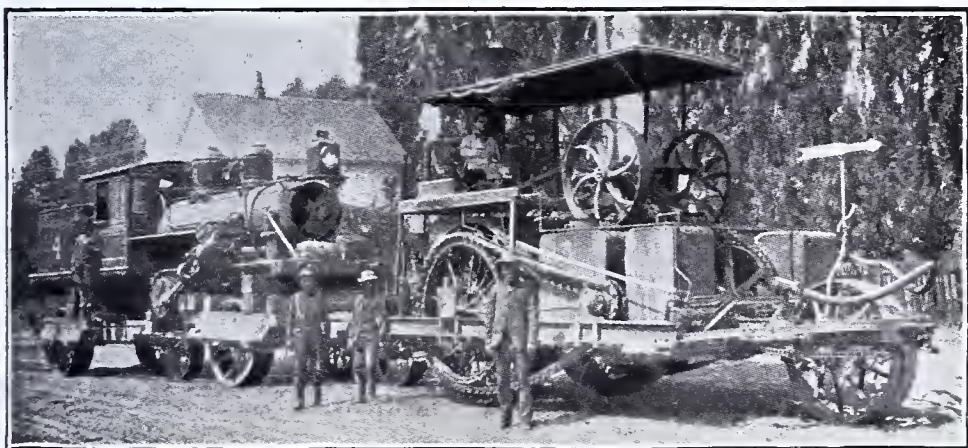
Open as well as enclosed omnibuses and wagonettes are employed in many of the large cities. The auto-omnibus is not only taking the place of the vehicle drawn by horses, but it is beginning to render valuable service in the territories of the trolley car and the suburban train. Transfer companies are already operating automobile buses from large cities to suburban districts, and between certain

trolley are not only unsightly in the city, but actually dangerous. Automobiles require none of these objectionable fixtures. They are at home on a smooth asphalt street, and with their rubber tires speed along almost noiselessly. They are independent of tracks, and can make their way easily through crowded thoroughfares, or can turn into any street. Pavements last much longer under automobile travel than with vehicles drawn by animals. Moreover, wagons moved by draft horses are excluded from the most fashionable residence streets of a city, while this obstruction to travel is not encountered by the motor car.

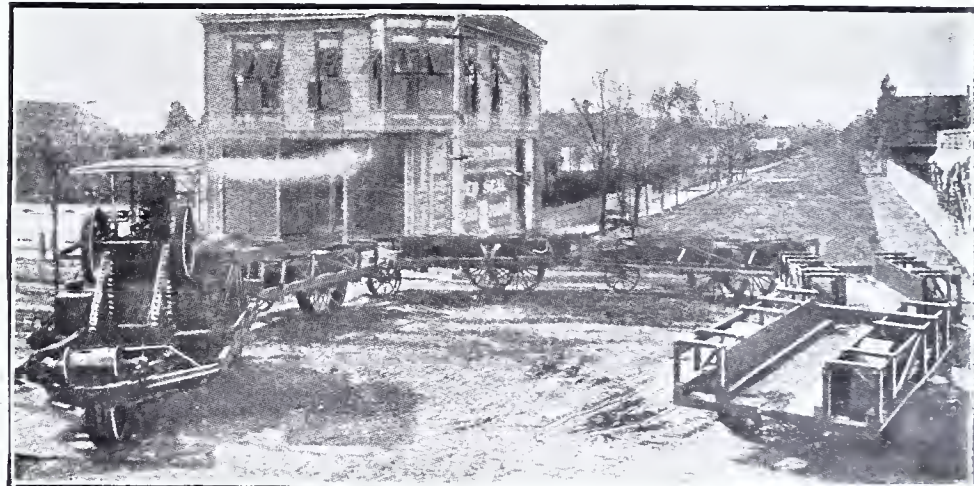
But of all the uses to which the automobile has thus far been put, perhaps none is more interesting than that of a tractor to pull heavy loads. The very labors of Hercules are performed by some of these machines, at



A TRACTION AUTOMOBILE HEADER AND BINDER ON A NORTHWESTERN FARM.



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THIS AUTOMOBILE FREIGHT TRAIN CAN TURN IN A STREET 48 FEET WIDE.

In the large cities where roads are good and electric current is accessible, the electric truck is rapidly superseding the dray horse. It is cheaper, more convenient, more efficient, more humane, and much more cleanly. Some of the large trucks now in use for freighting purposes have a capacity of ten tons, more than was formerly loaded on a railroad car. Most of these electric freight trucks are equipped with convenient electric

and the gasoline types are popular. Enterprising merchants are substituting them for horses and wagons. Express companies use them for delivering parcels; in some places they are employed for collecting and delivering mail; and, under fair conditions, they everywhere seem to perform their work with convenience and efficiency. These uses will become more general as suburban roads become better and power stations more numerous.

towns that are not directly connected by railroad or by trolley. In cities where the street car service is deficient, the automobile bus is beginning to supplement it. A well-equipped motor omnibus line has many advantages over the trolley car, the suburban train, or the horse omnibus. Railroad tracks always mar the neatness of streets where they are laid, and the passing cars disturb the quiet. The posts and network of wires of the

a saving of enormous expense. Long trains of heavily loaded freight trucks are run on common highways, or where there is no road at all; and huge farming implements on the loose, cultivated fields, are propelled by motors. These are technically called traction engines, but the term automobile is much more definite and appropriate. It is a self-moving vehicle, adapted for running on the ground without rails or an especially constructed track.



The locomotive is a traction engine, but not an automobile, because it requires a special track.

The first of these powerful machines were of the steam type, but electricity has replaced steam in the heavy omnibuses and freight trucks of the city, and gasoline is now entering the field. From these important developments, there is reason to believe that there will be a more harmonious distribution of hydraulic and other power stations for generating electricity for industrial purposes: and then the traction automobile will be operated first by gasoline, but eventually by electric power. Gasoline is, in most cases, better than steam: but electricity is better than either, when one is prepared for its efficient use. How successfully gasoline may be employed for heavy traction purposes is demonstrated by the motor car, the first of its kind, which was turned out of the Union Pacific shops at Omaha last March. This car has been found so satisfactory that more are being built, of a large type. They are to be operated on branch lines of the railroad system. Each car, besides baggage and toilet compartments, contains accommodations for 50 passengers, and the maximum speed is equal to that of the ordinary passenger train.

All these beneficial improvements have sprung up so rapidly during the past few years, that only those who take the time to investigate realize how swiftly changes are taking place.

For hill climbing, the motor vehicle has no equal. At Eagle Rock, N. J., the winner in the hill climbing contest ran a mile on a road having an elevation of about 15 per cent, in one minute and twenty seconds. A well built automobile of high power and on a good road goes up hill as it goes down.

As a racer, the automobile is without a rival. From a slow beginning, it has, in a few years, reduced the world's mile record to twenty-nine and four-fifths seconds. This is faster than any animal ever ran, and faster than the schedule time of any express train. Although not of prime importance in the utilization of the automobile, its capacity for remarkable speed is one of its greatest marvels.

When we come to consider the economic results of this development of the automobile, a still broader field opens. The age of the railway—the foundation of modern industrialism, the creator of vast wealth—is passing, in spite of all outward signs of power. Tomorrow will be the age of the motor—a revival of country life, a vehicle of national development greater than the railway, an industry destined to be inferior only to iron and coal, a social revolution in the organization of the community. Few even of our leaders of opinion have yet realized that we are on the eve of a more momentous change than that inaugurated by Watt and Stephenson.

A few years ago, the automobile was a noisy, ill-smelling, costly and unreliable machine—a public nuisance. Today, if it belongs to the better class of motors, it is silent; if it smells, the driver is to blame: it is within the reach of a man of modest

means, and it is as little likely to break down as any other fine product of human ingenuity. Of course, every car that one meets on the road does not possess these admirable qualities; but they characterize the latest inventions in the motor world. A car of twenty horse-power, capable of carrying four passengers at forty miles an hour, can hardly be heard by those on board: in fact, its extreme silence is a element of danger, as the only notice of its approach is the horn of the driver. It is on land, in that respect, what the canoe is on water. These more silent cars are the most expensive, but even moderately priced vehicles can be had as silent as anybody ought to desire them. This, for the benefit of the non-expert reader, is due chiefly to two factors: the balanced and slower revolutions of the engine by the increased number of cylinders, and the introduction of the valve which is opened and closed mechanically, in place of the valve held shut by a spring and opened by the suction of the piston.

Improved methods of combustion and lubrication have practically abolished offensive odors. Pneumatic tires—once the bane of the motorist's life—for he never dared be confident that he would not have to spend an hour in tedious and dirty repair of a puncture by the roadside—now with luck will run a thousand miles without mishap, and several thousand before they need be re-covered or replaced. And it is by no means certain that the inflated rubber tire is destined to remain an essential part of the motor-car. In the vehicle of the future, concussion due to inequalities of road surface may be absorbed by springs, either in the wheel or on the body. Some of the newest cars already show this improvement. The price of an automobile, too, is no longer prohibitive, and it costs much less to keep than a horse and carriage.

As to the probable influence of the automobile upon contemporary life, the first thing to note is the effect of the private car. Every owner of an automobile has at once a vastly increased radius of movement. The owner of a pair of horses in the country may be said to have a practical everyday radius of ten or twelve miles. For those who do not keep horses, it is of course much less. With an automobile of ten or twelve horsepower the radius of a family is comfortably thirty miles. Thus the car-owner has a sphere of activity enormously surpassing that of the horseowner, with all the additional opportunities of intercourse with friends. Business appointments can be kept, the train met at railway stations, every post and telegraph and telephone office reached, every physician made accessible, and with it all fresh air inhaled under exhilarating conditions.

The influence upon the community will be proportionately far-reaching. Country districts will revive, the value of suburban property advance: the man who has his office in town will no longer be dependent upon train service. This will tend to relieve the ominous congestion of city life. The next result will be an irresistible demand for better roads—possibly for a more adequate system of road control. This, in turn, will be of incalculable advantage to the agricultural communities.

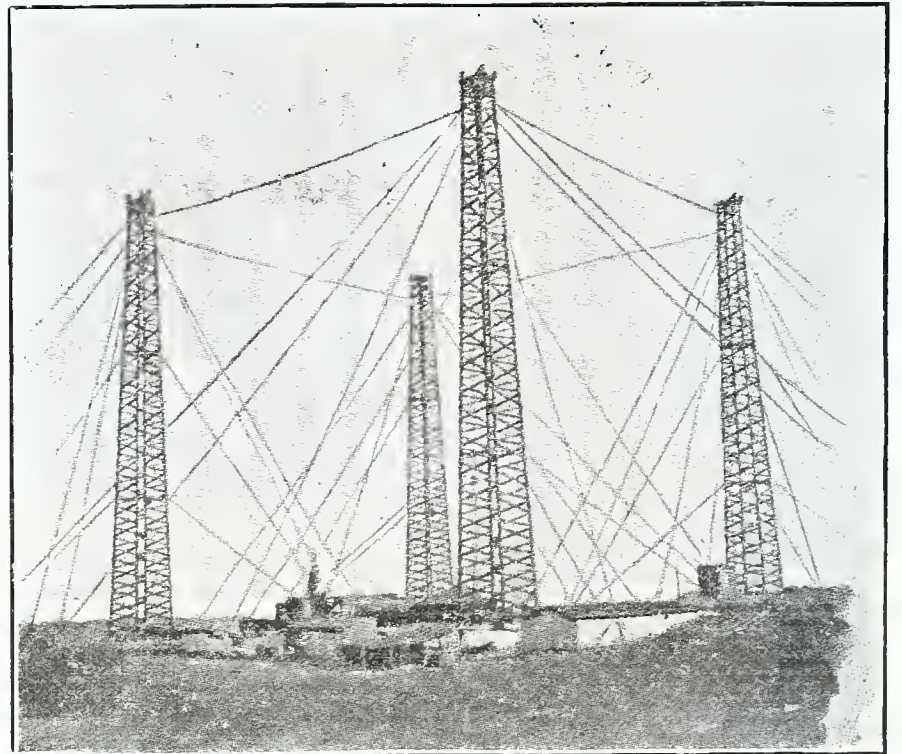
So much for the influence of the private car; but this will be but a minor factor in the coming development of motor traffic. The motor vehicle for business purposes, as above pointed out, has a sphere of its own. In time, the automobile may replace the electric railway, in spite of the adaptability and popularity of the latter. On the water, too, the motor will effect equally great changes. The coming of the automobile, in short, will cause a social and industrial revolution, and will add vastly to the sum of human pleasure and health.

## DEVELOPMENTS IN WIRELESS TELEGRAPHY.

WIRELESS TELEGRAPHY is coming daily into more practical use. The Postmaster General of Great Britain has made provisional arrangements which in effect can be called a "working partnership" with the Marconi Company, by which every telegraph office in the United Kingdom is to receive messages for transmission by the wireless system from the Marconi coast stations to ships at sea fitted with the apparatus. The various postmasters are kept informed of the movements of ships carrying the wireless apparatus, and the locality of the shore station through which messages may be sent. The rate—13 cents a word, with a minimum charge of \$1.60 for each telegram—does not compare unfavorably with the cost of ocean cabling. No longer will doctors be able to advise a sea voyage so as to get their patients clear away from the worry of business. Only in the South Sea islands will the harassed business man find relief from care, and doubtless ere long Marconigrams will drop from space upon him, even there.

advantage, a comprehensive system was projected for the benefit of our battleships. The scheme contemplates making it possible for vessels to be in communication with shores of the United States and its insular possessions, and with each other, at the greatest possible distances. A chain of stations extending from Cape Elizabeth, Maine, to the Caribbean, is already in practical operation; also stations on the Pacific coast and in the far away Philippines. Any warship in the West Indies will also be within telegraphic communication with a home station.

The equipment being installed generally permits of communication with dependable reliability between ships at sea and shore for 125 miles, while communications have been successfully carried on in the naval service for a distance of 225 miles, and by those curious freaks as yet inexplicable to science, messages inaudible by the operator for whom they were intended, have been overheard by stations 400 miles away. But a short



MARCONI TRANSATLANTIC STATION AT CAPE COD, MASS.

The great shipping agency of Lloyds has contracted for the use of wireless telegraphy for a period of fifteen years, and has installed the system on its land stations in all parts of the eastern hemisphere. Upwards of forty transatlantic passenger steamers are equipped with the instruments, and it is safe to predict that all to be built in the future will have them. The Italian government has appropriated \$150,000 for the establishment of the system between Italy and South America. The *London Times* has made a contract for a daily news service, by this method, from America. To our navy, it has become what the land lines are to the army. Although its use but a short time ago was unknown, naval officers now wonder how they were ever able to get along without it.

When it was demonstrated that wireless telegraphy could be employed to

time ago, the commander of a fleet was able to communicate directly with vessels at no greater distance than five miles, the distance at which signals by flags may be read with reliability.

A most interesting project contemplates connecting New Orleans with the Isthmus of Panama by wireless. This will necessitate the erection of two powerful stations at New Orleans and Colon. New Orleans was selected because there is a clear sea-way between the two points. The distance is about 1400 miles, and messages sent will be flashed all the way across the Gulf of Mexico and the Caribbean Sea. Every confidence is felt in the success of the project.

The first message sent from one of our warships to the Navy Department at Washington was marked by a peculiar incident. The message was transmitted from the cruiser Colorado



which was coming up the coast, and when about 100 miles from the light-ship at Nantucket, telegraphed there by wireless, the message being then sent to the Department over the land lines. It happened that the operator of the station in Washington overheard the message from the ship to Nantucket, so that the Department was informed of the position of the vessel before the land telegram was received. It is a common thing for the Washington operator to hear messages sent in the neighborhood of Boston. Thus, what only a short time ago seemed a mere scientific dream, has become an every day occurrence.

The accompanying cut shows the Marconi station which has been established at Cape Cod, Mass. In its simplest form, the system comprises a tower which reaches a hundred or two feet into the air, and holds a plate or conductor which receives electric undulations from the earth station and transmits them through space to a remote point, there influencing a similar plate through a special form of receiving device known as a coherer, which is simply a glass tube containing metal filings between two circuit terminals. The electric waves cause these filings to cohere, and so vary the resistance to the passage of the current as to give a basis for transformation into a record. In the Marconi apparatus, the filings consists of a mixture of nickel and silver and a trace of mercury. In their normal condition, these have an enormous resistance, and constitute a practical insulator, preventing the flow of the local current; but if they are influenced by electric waves, coherence takes place and their resistance falls, allowing the local current to pass. The coherence continues until the filings are mechanically shaken, when they will at once fall apart, as it were; insulation will be established, and the current will be broken. If, then, a coherer be brought within the influence of the electric waves thrown out from a transmitter, coherence will occur whenever the key of the transmitter at the distant station is depressed. Marconi has devised an arrangement in which a small hammer is made to rap continuously upon the coherer by the action of the local circuit, which is closed when the electric waves pass through the metal filings. As soon as the waves cease, the hammer gives its last rap, and the tube is left in the de-cohered condition ready for the next transmission.

Our consul general at Halifax, Nova Scotia, reports that a station is about to be erected at Sable Island—"the graveyard of the Atlantic," which now gives up its news only when a government steamer calls there. A high wireless signal staff will be erected, from which will hang four wires, called "aerials," at the different points of the compass, leading from the top of the staff to points 250 feet away, and there fastened to posts with glass insulators. These prevent the inclination to ground, and cause the messages to pass into the operating room. It is expected that wireless telegrams will soon appear regularly in all the leading newspapers of the world.

In the Old Testament Book of Job, it is written: "Canst thou send lightnings that they may go and say unto thee 'Here we are?'" For thousands of years this has been regarded as a feat only within the power of the Infinite; but today the inventor—that patient modern Job—has accomplished the task. Imagination pauses before the effort to realize the possible development which may come about before the century is much older.

## DULUTH AERIAL FERRY BRIDGE.

History, Construction and Operation of the Only Bridge of Its Kind in the World.

BY NORTON MATTOCKS.

The Duluth ship canal, through which passes annually the same commercial tonnage that is carried through the famous Suez canal, was cut across Minnesota Point by the City of Duluth in 1871, and pile and timber cribs to hold its banks were constructed the following year. This canal was later adopted by the U. S. Government, which in 1901 widened it from 240 feet to at least 300 feet, and constructed substantial and permanent piers of crib work and concrete. The opening of the canal converted Minnesota Point into an island, and the city accepted the responsibility of providing the inhabitants with adequate communication with the main land. Until 1897, a row boat ferry was maintained but, as the population of the Point steadily increased and it became popular for summer homes, a steam ferry for transportation of passengers and freight across the canal was substituted in that year for the row boats, and has been in use ever since.

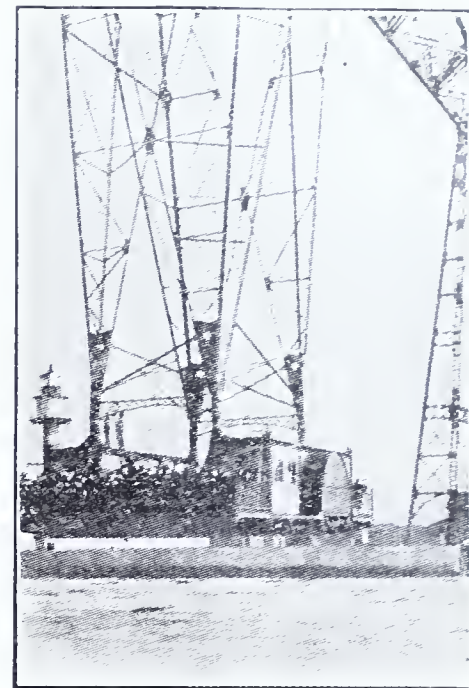
The concrete piers to sustain the bridge structure were built under the original contract and the work then was abandoned by the contracting company. After various delays, a contract finally was entered into, in Feb., 1904, with the Modern Steel Structural Co., of Waukesha, Wis., for a riveted truss on riveted steel tower: the ferry car to be supported by an inverted steel tower, in accordance with designs made by the Structural Company's engineer, Mr. C. A. P. Turner, and submitted to the city engineer for approval. The work was erected and completed during the winter of 1904-5.

In the foundations of the bridge there are 730 tons of concrete. In the 8 piers, which extend below the water level of the lake, there are 24 anchor bolts, two inches in diameter, fastened by means of large washers to the bottom of the piers which hold the tower in position.

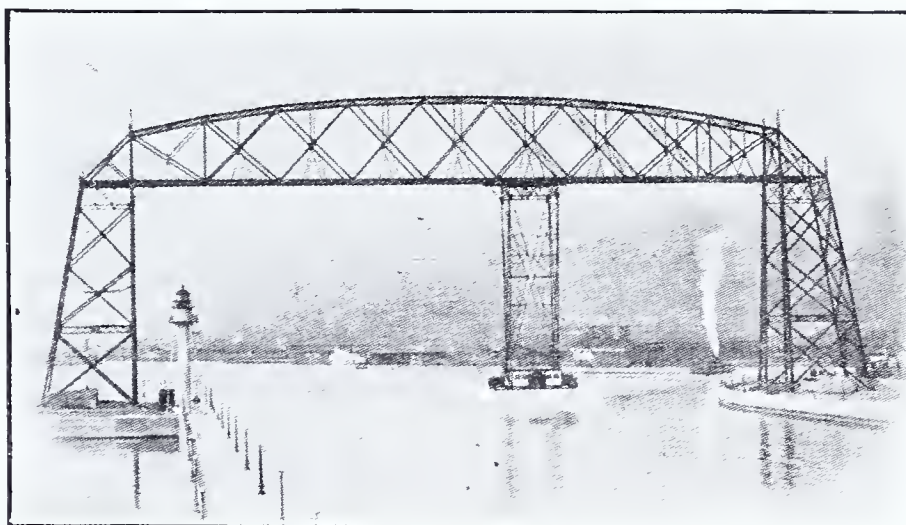
The car will carry at one time 125,000 lbs. which is equivalent to a fully

to turn on immediately power from the other. A further safeguard against delays is provided by an adequate hand power, which can be used in the event of the failing of both sources of power.

The normal speed of the car is four miles per hour, but the electrical machinery is capable of propelling the car at twice that rate. Thus the passage across the canal is made in a little over one minute.



VIEW OF CAR CROSSING WITH OVER 800 PASSENGERS.



COMPLETED BRIDGE IN OPERATION.

The Aerial Bridge scheme came about through the imperative necessity of better communication with the Point at a less cost than was being paid for the steam ferry service. A tunnel was proposed, but was abandoned on account of its prohibitory cost. A draw-bridge, a lift bridge, a roller-bridge were proposed in turn, but all failed to secure the necessary approval of the United States war department, whose requirements demanded a method of transportation which would not impede the traffic through the canal. The suspended car transfer bridge at Rouen, France, was brought, in 1899, to the attention of the city engineer, who prepared a plan, adapting the general scheme to the conditions at the Duluth ship canal. The idea was received favorably by the U. S. war department and the people of Duluth. A bond issue for the amount of the estimated cost of the structure (\$100,000) was sanctioned by the state legislature, and a general specification and contract were prepared and let for the erection of the structure in 1901.

loaded, double-truck street car, two loaded wagons with teams, and 350 passengers.

The bridge has a clear height, above the normal level of Lake Superior, of 135 feet. This height was fixed by the Lake Carriers' Association, and will permit the passage of the highest masts. The truss at the center is 51 feet high, making the total height of the bridge above the water 186 feet. The width, center to center of trusses, is 34 feet, and the clear span is 393.75 feet.

The car platform is 34x50 feet and contains in addition to the space for a street car and two loaded wagons, two enclosed and glazed cabins of pleasing interior finish, each 7x30 feet. The elevation of the bottom of the car above the U. S. Government piers is 6 feet and, when the car is at rest, its whole length is over land; hence, it is not an obstruction or menace to navigation. Seven hundred tons of steel and over 100,000 rivets were used in the construction of the bridge.

The motive power of the ferry car is electricity, current being supplied from two separate sources having different cable systems; and in case of the failure of one source, a switch, under the control of the motorman, enables him

Two 40 H. P. motors, placed under the floor of the car, actuate two drums, each 9 feet in diameter, on which are wound one-inch cables extending to the truss and thence over 9-foot idle-wheels, through the inside of the lower chords to the towers, where they are fastened, producing the motion, which causes the car to run. The track that carries the car and hangers is arranged ingeniously, being enclosed on three sides within the box section of the lower chord, thus avoiding the danger of its becoming coated with snow or sleet in winter. There are four rails, within the two bottom chords, two in each, and 32 wheels arranged in pairs (8 pairs in each lower chord) roll on them, which carry the truck. As the bearings of these wheels, as well as those of the drums and idlers, have roller ball end thrust bearings, the friction of all the working machinery is reduced to a minimum. The hand power method of propulsion is applied by the use of lever handles, which, by a series of gears and sprockets, communicate power to the drums on the car.

The cost of the steam ferry-boat service averaged \$11,000 per annum. The cost of the ferry bridge will be \$8,000, which includes operation, maintenance and the interest on the bonds issued for the construction of the bridge. Thus a sinking fund of \$3,000 for the payment of the bond issue can be created, which in time will pay for the bridge.

The car operates as well when the wind blows 60 miles per hour as when no wind is blowing. The deflection of the car is but 1, 7 16 inches under a broad side of some 60 miles per hour.

The approximate cost of electric power to operate the bridge is \$800 per annum.

The car makes 12 trips per hour between 5 a. m. and 12 p. m., and two trips per hour from midnight until morning.

The approach to the car is by means of a paved roadway and two broad cement walks of easy grade joining on to the buffer platform. The general type shows concrete construction.

The safety of passengers is insured by two sets of gates, one set on the car and the other on the approach. Both are opened and closed by the motorman.

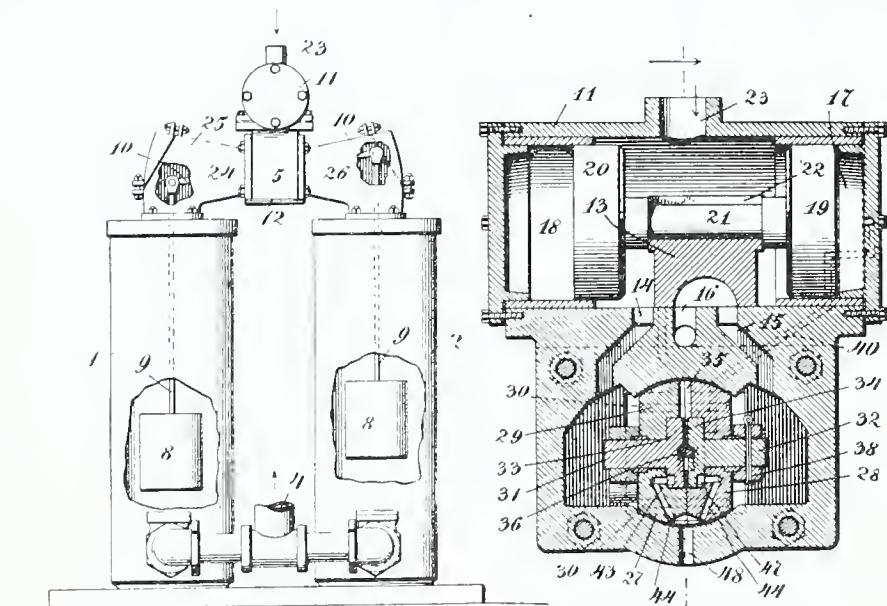


# CLEVER NEW PATENTS.

VALVE.—FERTILIZER DISTRIBUTER.—NOZZLE.—WEATHER STRIP.

## Valve.

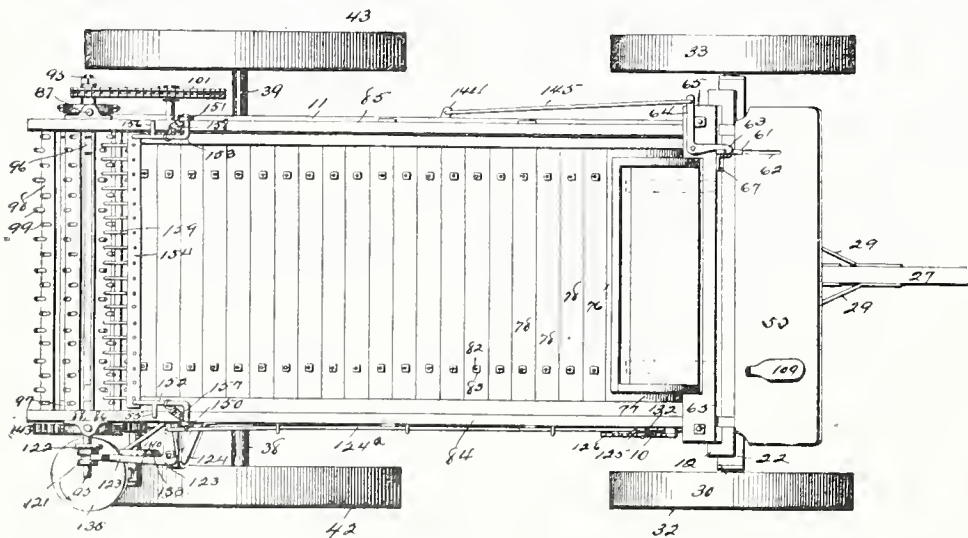
Messrs. John Lee Latta and James Andrew Martin, of Hickory, N. C., have secured a patent on important improvements in valves for compressed air water elevators of that type in which the air under pressure is forced alternately into a pair of cylinders or tanks for the purpose of expelling the water therefrom.—In the accompanying illustration, a pair of chambers or tanks are shown at 1 and 2, each being provided with a water inlet valve, opening under the influence of external pressure, and closed when the air is acting to force the water from the chamber. The two chambers are connected to a common discharge pipe 4 leading to a point of delivery. At the top of the chambers is



a valve casing 5 containing a suitable valve and valve actuating mechanism, a portion of which is connected to buckets 8 arranged respectively within each chamber, and serving, when the water is discharged, to act through rods 9 and rocker arms 10, to effect the initial movements of the valve operating mechanisms. Briefly described, this mechanism consists of a main air valve associated with a secondary controlling valve, the latter including a pair of members, each having ports for controlling the flow of air to and from the main valve operating devices. A ported casing contains the secondary valve, and an air port leads to the casing at a point between the two valve members, thereby serving to supply air between the members to hold them on their seats and to operate the main valve actuating devices.

## Fertilizer Distributer.

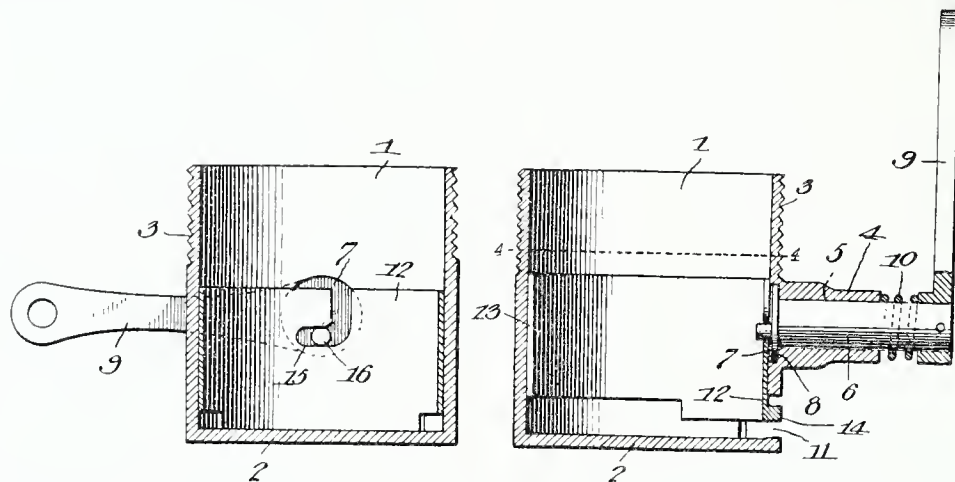
A novel fertilizer distributer has been patented by Mr. John M. Hess, of Grundy Center, Iowa. A vehicle body is employed, in the bottom of which operates a conveyer made up of slats 78 and a head piece 76. At the rear end is journaled a rotating distributor drum 98, over which is arranged a stationary comb 154. The drum and conveyer are operated from the rear axle, which



rotates with the wheels, and novel clutch mechanism is employed for automatically stopping the conveyer when the material has been entirely delivered from the vehicle. The operation of the conveyer toward the rear, places tension on certain springs, and to return said conveyer to its initial position, the driver has only to operate a treadle, whereupon the springs are released and react to return the conveyer to its original position.

## Nozzle.

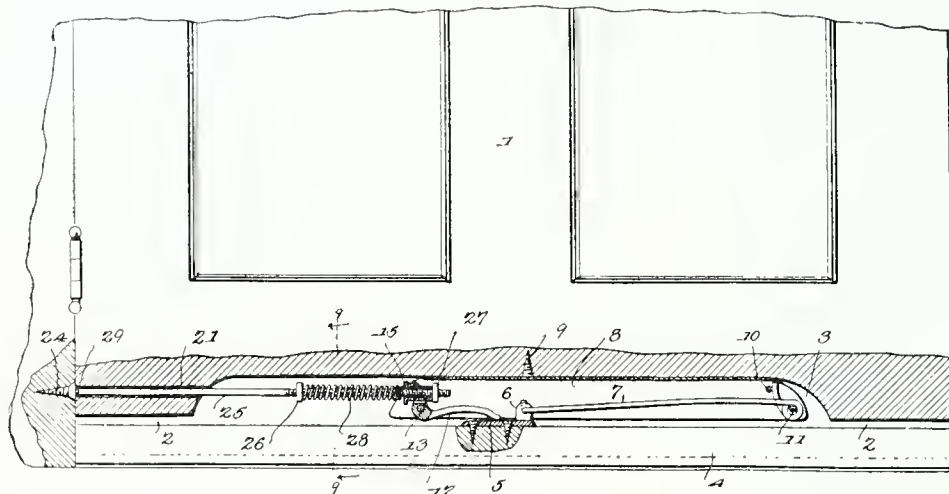
The class of street sprinklers has been lately improved by an invention of Mr. Edward E. Ritter, of Milton, Pa., the invention relating more particularly to the discharge nozzles. As shown in the accompanying illustration, the new structure is a very simple one. An outer cylindrical casing 1 is employed, having a discharge opening 11. Within this casing a sleeve or collar 13 is vertically slidable, the same having a depending flange 14 that is movable



downward across the opening 11. One side of the casing has a nipple 4, and in the same is journaled a spindle 6, having an operating arm 9. The inner end of the spindle is provided with a disk 8, having an eccentric pin 16 that engages in a slot 15 in the collar. Thus by swinging the arm, which can be connected to an ordinary operating lever, the collar can be raised or lowered, so that the sides of the outlet 11 may be varied, or said outlet can be entirely closed.

## Weather Strip.

Mr. Clarence M. Eveleth, of Plymouth, N. H., has patented a novel weather strip, whereby a weather tight joint is made between a door and sill when the door is closed. The bottom of the door 1 has a slot 2, in which is vertically slidable a weather strip 4. This strip is normally held elevated by a spring 7 when the door is open. A lever 17 is, however, pivoted within the slot, and is arranged to bear upon the upper edge of the strip and force the same downward against the action of the spring 7. A rod 25, connected to the lever and



arranged to abut against a screw 24 in the door casing, swings said lever. As long as the door is open, the rod 25 is out of action, and consequently the spring 7 will hold the weather strip raised; but when the door is closed, the outer end of the rod 25 will abut against the screw 24, and be forced inwardly, thus swinging the lever down and forcing the strip down across the crack into engagement with the door-sill.

## PATENTS, CAVEATS, TRADE-MARKS, COPYRIGHTS, AND DESIGNS. TWENTY-FIVE YEARS PRACTICE.

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## LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

### IMPERIAL BOTTLE CAP & MACHINE CO. et al. v. CROWN CORK & SEAL CO. OF BALTIMORE CITY.

(Circuit Court of Appeals, Fourth Circuit.  
139 F. R. p. 312.)

#### 1. PATENTS—INVENTION—COMBINATION OF OLD ELEMENTS.

Where a patent covers a combination of old elements, and none of the prior inventions exhibits or suggests any co-operation of the elements upon the principle adopted by the later patent, or upon any principle adapted to serve the same purpose, the use of the old elements may limit, but cannot defeat, the patent.

#### 2. SAME—NOVELTY—PRESUMPTION FROM GRANTING OF PATENT.

The presumption of novelty arising from the granting of a patent is greater or less according to circumstances. If the patent relates to something of temporary interest, and the object sought is of little importance, it may receive but little attention in the Patent Office, and the presumption is slight; but where the problem sought to be solved is of such importance that its solution promises great pecuniary returns, and it is shown that all the claims were subjected to critical analysis, resulting in amendments and disclaimers designed to distinguish the invention from everything in the prior art, the presumption of novelty is greater than in those cases where the patent may have passed by inadvertence.

#### 3. SAME—INVENTION—PRESUMPTION FROM UTILITY.

Where there is an actual and admitted improvement in a combination of old elements, and its utility is shown in a marked degree, there should be controlling reasons to rebut the presumption that there is a sufficiency of invention to support a patent.

#### 4. SAME—BOTTLE STOPPERS—INFRINGEMENT.

The Painter patent, No. 468,358, for a bottle stopper, was not anticipated in the prior art; and, while the device consists of a combination of old elements, it was the first to be fully successful in a field where there had been many failures, and discloses patentable invention. Such patent, however, is not infringed by the device of the Abbot patent, No. 704,467, which employs the same elements to accomplish the same result, but under a different arrangement in which they severally perform different functions, and are applied to bottles having differently shaped necks.

### JEFFERSON ELECTRIC LIGHT, HEAT & POWER CO. v. WESTINGHOUSE ELECTRIC & MFG. CO.

(Circuit Court of Appeals, Third Circuit.  
139 F. R. p. 385.)

#### JUDGMENT—PATENTS—SUIT FOR INFRINGE- MENT—RES ADJUDICATA

In order that a decree adjudging the invalidity of a patent shall render that question res adjudicata as between the complainant and one not a party to the record, but who in fact conducted the defense at his own expense, he must have done so openly so that he would have been bound by the decree if it had sustained the patent.

### LANGFELD et al v. ALBRIGHT.

Circuit Court of Appeals, Third Circuit.  
139 F. R. p. 387.)

#### PATENTS—INFRINGEMENT—COIN PURSE.

The Albright patent, No. 439,085, for a coin purse, construed narrowly, as it must be in view of the prior art, especially of the Rundlett patent, No. 201,201; held not infringed by a purse substantially the same in construction and the manner of its use as the Rundlett patent.

### AMERICAN CARRIAGE CO. v. WYETH.

(Circuit Court of Appeals, Sixth Circuit.  
139 F. R. p. 389.)

#### 1. PATENTS—ANTICIPATION.

The effect of a device as an anticipation is not altered by the fact that it was made to serve a purpose additional to that for which it was used in the second case, where, so

far as the latter goes, the two are equivalents.

#### 2. SAME—SLEIGH RUNNERS.

The Wyeth patent, No. 400,381, for a sleigh runner for wheeled vehicles, claim 12, the essential feature of which is the use of side plates of iron or steel to fasten the rave and knees together, instead of making a mortise and tenon connection, is void for anticipation and lack of patentable invention.

### McCASLIN v. LINK BELT MACHINERY CO. et al.

(Circuit Court, S. D. New York. 139 F. R.  
p. 393.)

#### 1. JUDGMENT—DECREE IN INTERFERENCE PROCEEDINGS—PERSONS CONCLUDED.

A decree in interference proceedings determining priority of invention between two applicants for patents is not binding as to the date of invention by one of the parties, on one who was not a party, and does not claim under either patent.

#### 2. PATENT—ANTICIPATION.

That a prior patent for the same invention was issued to the same patentee does not avoid anticipation.

#### 3. SAME—CONSTRUCTION OF CLAIMS—COM- BINATION.

Where a claim of a patent is for a combination, it must be for an operative combination; and if an element essential to make it operative is shown and described in the specification, but is omitted from the claim, it must be read into the claim.

#### 4. SAME—INFRINGEMENT—ENDLESS CHAIN CONVEYORS.

The McCaslin patent, No. 503,870, for an endless chain conveyor, claims 3 and 4, cover improvements only on what was known in the prior art, and must be strictly construed and limited to the construction shown, and the patentee is entitled to invoke the doctrine of equivalents only where the changes are colorable merely. As so construed, such claims held not infringed by a conveyor in which the mechanism operates in a manner substantially different to accomplish the same results.

### BONSALL v. T. J. HAMILTON MFG. CO. et al.

(Circuit Court, S. D. New York. 139 F. R.  
p. 399.)

#### 1. PATENTS—INFRINGEMENT—WARDROBE TRUNKS.

The Bonsall patents, Nos. 604,346 and 642,075, both relating to wardrobe trunks, were not anticipated, and disclose invention. Claim 3 of the former, and claim 4 of the latter, also held infringed.

#### 2. SAME—NOVELTY—GARMENT HANGERS.

The Bonsall patent, No. 661,947, for a garment hanger for use in wardrobe trunks, is void for lack of patentable novelty.

### BONSALL v. HAMILTON-NOYES CO.

(Circuit Court, S. D. New York. 139 F. R.  
p. 403.)

#### PATENTS—INFRINGEMENT—GARMENT HANGER

The Tenney patent, No. 669,561, claim 3, for a folding hanger for garments, adapted for use in a closet, drawer, or trunk, was not anticipated, and discloses invention. Also held valid as against the defense of prior invention, and infringed.

### WHITE-SMITH MUSIC PUB. CO. v. APOLLO CO. (two cases.)

(Circuit Court, S. D. New York. 139 F. R.  
p. 427.)

#### 1. COPYRIGHT—SUIT FOR INFRINGEMENT— TITLE TO SUPPORT.

Where the composer of a piece of music has placed it in the hands of a publishing company for publication and sale, it may reasonably be inferred that he intended to authorize the company to copyright the same; and where it does so in its own name, and he afterward ratifies its action, it is vested with the legal title to the copyright, which will support an action for its infringement.

#### 2. SAME—INFRINGEMENT—MUSICAL COM- POSITION.

A musical composition, as an idea or intellectual conception, is not subject to copyright, but only its material embodiment in the form of a writing or print may be copyrighted; and a copyright of such a printed composition is not infringed by a perforated record or sheet designed for use with mechanism to play the composition on a musical instrument.

### BRADLEY v. ECCLES et al.

(Circuit Court of Appeals, Second Circuit.  
139 F. R. p. 447.)

#### PATENTS—INFRINGEMENT—PACKING FOR THILL COUPLINGS.

The Bradley patent, No. 609,928, for a combination in a thill coupling, with a draft eye having spherical recesses in its jaws, and a draft iron having a spherical knuckle, of an interposed spherical packing, which constitutes the only novel element, is a narrow one, in view of the prior art, and must be limited to the precise form of packing shown, which is a single piece of hard leather, molded before application into such shape as will cover the knuckle completely, but with an open longitudinal joint, which permits it to be swung open so as to slip over the knuckle, whereupon it resumes its spherical shape. It is not infringed by the use in such a coupling of flat pieces of leather, notched on the edges so that when the jaws are closed they are pressed around the knuckle, into a spherical shape.

### ANDERSON v. METROPOLITAN FI- NANCE CO.

(Circuit Court, S. D. New York. 139 F. R.  
p. 451.)

#### PATENTS—VALIDITY—MEANS FOR CASHING SALES ACCOUNTS.

The Anderson patent, No. 704,168, for means for cashing sales accounts, held not so clearly void on its face as to warrant its being so declared on demurrer in view of the presumption of validity arising from the granting of the patent.

### SANITAS NUT FOOD CO., Limited, v. VOIGT et al.

(Circuit Court of Appeals, Sixth Circuit.  
139 F. R. p. 551.)

#### 1. PATENTS—NOVELTY—CHANGE IN FORM OF COOKED GRAIN.

Whatever novelty, in a patentable sense, there may be in flakes of cooked wheat, must be found in some superior efficaciousness or some new properties which they possess and not in any mere change of form produced by mechanical division of the cooked grain either before or after the last step in cooking. Nor does the fact that such flakes contain some dextrin make them a new product in a patentable sense, that being true to a greater or less extent of other forms of cooked wheat.

#### 2. SAME—COOKED WHEAT PRODUCTS— GRANOSE FLAKES.

The Kellogg patent, No. 558,393, claim 2, for an improved cooked alimentary product from grain, such as wheat, in the form of "large, attenuated, baked, crisp, and slightly brown flakes of practically uniform thickness, the same being readily soluble, and containing dextrin," is void for lack of patentable invention, it appearing that such product does not differ in its properties or food value from other forms of cooked wheat previously known, except perhaps slightly in degree.

### JENNER v. BOWEN.

(Circuit Court of Appeals, Sixth Circuit.  
139 F. R. p. 556.)

#### 1. PATENTS—PRIOR PUBLIC USE—EXPERI- MENTAL USE.

The duplication of a set of rollers on a machine which was before complete and operative, and had been in use for two years, the purpose being merely to re-enforce the work of the original rollers in certain cases where necessary, did not constitute a part of the invention of the machine, so as to extend the time within which a patent might be applied for.

#### 2. SAME—PUBLIC USE.

Where the inventor of a machine made and set up one for a customer, who paid for it and used it commercially, selling the product, as was intended, neither he nor his employees being under any obligation of secrecy, such use was public and not private, and its continuance for more than two years before application for a patent deprived the inventor of the right to a patent.

#### 3. SAME—EFFECT OF INVENTOR'S INSANITY.

The right of one who purchased an unpatented machine from the inventor, with the intention and understanding that it was to be used commercially, to so use the same, is not terminated by the subsequent insanity of the inventor, and such continued use prior to the application for a patent constitutes a prior public use within the meaning of the patent law.

#### 4. SAME—PRIOR PUBLIC USE—MACHINE FOR MAKING BOTTLE WRAPPERS.

The Biedinger patent, No. 639,395, for a machine for making bottle wrappers is void for prior public use of the machine for more than two years before the filing of the application.

### AMERICAN CRAYON CO. v. SEXTON et al.

(Circuit Court of Appeals, Sixth Circuit.  
139 F. R. p. 564.)

#### 1. PATENTS—PATENTABILITY—MOVEMENT OF MACHINE.

The movement of a machine irrespective of the mechanism which causes it is not patentable.

#### 2. SAME—INFRINGEMENT—MACHINE FOR MAKING CRAYONS.

The Liedke patent, No. 476,051, for a machine for making crayons, claim 2, covering a rocking or tilting device for loosing and discharging the crayons from the mold, is valid, and of a primary character, entitled to a liberal range of equivalents. It is not infringed, however, by mechanism for lifting and dropping the molds to accomplish the same purpose, which is not the equivalent of that of the patent.

#### 3. SAME.

The Cowdery, Curtis & Liedke patent, No. 476,038, for a machine for making crayons, claims 1, 6, and 9, covering mechanism for alternately lifting and dropping the molds for the purpose of jarring the crayons loose, construed, and held valid and infringed.

### GENERAL ELECTRIC CO. v. YOST ELECTRIC MFG. CO. et al.

(Circuit Court of Appeals, Second Circuit.  
139 F. R. p. 568.)

#### 1. PATENTS—INVENTION.

Merely making in one piece that which was before made in two does not constitute patentable invention, nor does it because of the fact alone that the one-piece device is cheaper or more durable, when such results are merely such ordinary consequences of dispensing with joints as would naturally be anticipated by a workman.

#### 2. SAME—NEW FUNCTION.

The assertion of a new function or effect, to give patentability to a device, should only be sustained upon proof of novel or unexpected properties or uses capable of producing novel results.

#### 3. SAME—INSULATING LINING FOR LAMP SOCKETS.

The Painter patent, No. 718,378, for an insulating lining used in incandescent lamp sockets and a process of making the same, so far as relates to the claims covering the product, is void for lack of patentable invention.

### KEASBEY & MATTISON CO. v. PHILIP CAREY MFG. CO. et al.

(Circuit Court, S. D. New York. 139 F. R.  
p. 571.)

#### 1. PATENTS—EVIDENCE OF INVENTION— PUBLIC ACQUIESCENCE.

Acquiescence by the public in a patent for almost its entire life, while not conclusive, is persuasive evidence of its validity, and is entitled to great consideration, somewhat approximating that accorded to a prior adjudication.

#### 2. SAME—ANTICIPATION.

Anticipation is not shown by broad and general language in prior patents, although, interpreted in the light of the later invention, it may be said to include the same.

#### 3. AMENDMENT OF APPLICATION.

An applicant for a patent has the right to alter and amend his specification to conform to the state of the art as the facts are developed in the Patent Office, so long as he does not, by enlarging its scope, appropriate prior inventions, or any that have in the meantime gone into public use; and he may also amend his claims to conform more closely to the specification and drawings.

#### 4. SAME—INFRINGEMENT—COVERING FOR STEAM PIPES.

The Hamore patent, No. 545,843, for a nonconducting covering for steam pipes, etc., made of a composition which includes as its nonconducting element a major proportion of carbonate or of calcined magnesias, and a sufficient quantity of fibrous material, such as asbestos fiber, to bind it together, discloses invention, and was not anticipated nor rendered void by prior public use. Also held infringed.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Grant Plummer, Salina, Kansas. Two patents. Hay Loaders.—Both of these patents cover important improvements in hay loaders of that type, in which a wheeled frame propelled by draft animals is equipped with a vertically movable fork, normally disposed in position to constitute a rake, and tiltably mounted upon this support in order to permit the dumping of a load accumulated by the fork in the normal position thereof, and subsequently elevated to the top of the stack. The first patent embraces a wheeled frame, an arch rising from the rear portion thereof, an open fork frame swung over the upper end of the arch and carrying a tiltable fork, a lever connected with the fork frame to elevate the same, and a swinging fulcrum for the lever.

The second patent is provided with means adapted to permit the fork to be arranged in a horizontally and upwardly inclined position, for retaining the load in place, and capable of maintaining the fork in such position with relation to the ground during its entire upward movement. The machine is provided with upright levers fulcrumed between their ends on the fork frame at opposite sides thereof, and having their upper arms connected by bars with the fork. A rock shaft is connected with the lower arms of the upright levers for operating the same.

Arthur Pracna, Everett, Washington. Swivel Band Saw Guide.—This patent marks an important advance in the art of lumber sawing, as it provides means for positively counteracting the tendency of a band saw to deviate or lead out, from a straight line. It is provided with means for leading the band saw before the same enters the material to be cut, whereby absolutely perfect lumber may be obtained. The invention consists of an upper band saw guide capable of a horizontal rotary movement on a axis or center coincident with the center of the guided portion of a band saw. The saw guide is provided with an arm having arc-shaped bearing portions, which are received within corresponding arc-shaped bearings of a hanger. The adjusting means consists of a threaded rod or shaft, which engages a pivoted block mounted on the movable portion of the saw guide.

Arthur Smith, Eagle Grove, Iowa. Wire Stretchers. Two patents.—Both of these patents relate to improvements in devices for stretching fence wires in the construction of fences, and they provide means for stretching fence wires to the desired tension and for holding them at such tension while they are being stapled or otherwise secured to a fence-post. The first patent comprises a combined guide and ratchet bar, provided at one end with means for securing it to a post, a slide having an opening for the bar and provided with means for connecting it with a wire, pulleys mounted on the bar and on the slide, and a flexible connection arranged on the pulleys for operating the slide. The slide is locked against outward movement by a single spring actuated dog which engages the bar.

The second patent is provided with a double-acting pawl or dog, adapted to be readily arranged for locking the carrier against outward movement, and capable of being also set to permit the carrier to slide outward freely. The pawl or dog is pivoted at an intermediate point to the slide or carrier, and either end is adapted to engage the combined guide and ratchet bar. A yieldable device is slidable on

the carrier for engaging the pawl or dog at either side of the pivotal point.

Winfield S. Houser, Du Bois, Pa. Hose Coupling. Two patents.—Both of the inventions covered by the patents are designed for the quick coupling of hose sections. The first comprises elements secured to the ends of the hose sections, one of the elements being arranged to be fitted within the other, and having diametrically opposite outstanding and forwardly projecting portions. The edge of the other element has diametrically opposite seats to receive the forwardly projecting portions of the projections, and a coupling ring is revolvably mounted on the member having the seats and overhangs the same. The ring is provided with bayonet slots that extend but partially through the same, and receive the outstanding portions of the projections, the inner end walls of the slots being substantially coincident with the end walls of the seats.

The second patent is an improvement on the first, in that the couplings are interchangeable. The members each comprise a shell having a retaining flange at its inner end, a tapering outer end, and an intermediate threaded portion. A locking ring is rotatably mounted on the shell in rear of the flange, and is removable over the threaded portion and tapered end. The ring, furthermore, has a socket in the outer margin that extends entirely through the ring, and is also provided on its rear face with an inclined shoulder extending from the socket. The other coupling member has a forwardly projecting hook that passes through the ring socket and is adapted to bear against the inclined shoulder of the rear face of the ring. This hook terminates short of the inner edge of the ring. A tapered tube clamping sleeve surrounds the outer portion of the shell having the flange, and its inner end is screwed upon the threaded portion of the shell. The sleeve has its inner end arranged contiguous to the rear face of the ring and inside the end of the hook, thereby constituting a shoulder that prevents the removal of the ring over the tapered end of the shell.

Wells H. Porter, Albion, N. Y., inventor; Frank G. Sherwood, of the same place, assignee one-half interest. Tuning Hammer.—This invention relates to devices for turning the posts or pins holding the strings of musical instruments. A pin-engaging socketed head is employed having an offset arm on which a handle element is pivoted, the arm being disposed in the path of movement of the hammer element. The lever is pivoted upon and disposed longitudinally of the hammer element, the lever having an engagement with the opposite arm of the pin engaging element. By this arrangement, the operator has only to grasp the lever and handle element and swing the same towards each other, afterwards releasing them, whereupon slight blows are imparted to the pin-engaging element as desired, in order to effect the turning of the latter. The arrangement moreover is readily reversible, so that the turning operation may be effected in either direction.

Amos R. Wilson and Lester M. Dull, inventors, Toledo, Ohio; A. R. Gordon, Floyd N. Dull, and W. E. Dittenhaver, assignees one-half interest, same place. Glass Molding Machine.—Broad claims have been secured in these two patents on a novel machine for manufacturing glass articles, and more particularly insulators for electrical conductors, though it is evident that the machine may be modified for manufacturing other devices. A rotary carrier is employed having a series of molds that operate over novel glass feeding means covered by one of the patents. These molds are automatically opened

and closed, and associated with the same are cores that are automatically lowered and raised into and out of co-action with the molds. With the machine, as the carrier turns, the cores are successively lowered into the molds, after which the glass is forced into the same. The cores are then elevated, the molds are opened, and an automatically movable carrier catches the articles as they drop therefrom, and deposits them outside the machine. With this mechanism, the articles can be made with accuracy and in great numbers at small cost.

John M. Hoke, Statesville, N. C. Wrench.—This wrench is designed for use on either angular or round objects such as nuts and pipes. It consists of a stock that comprises pivotally connected shank sections. The handle is carried by the end of one section, and a jaw is carried by the free end of the other section. Another jaw is slidably mounted on the stock, and is movable toward and from the first-mentioned jaw. A sleeve member is slidably mounted on the stock between the movable jaw and handle, and a pivoted link connects the sliding jaw and sleeve member, while a screw, journaled upon the handle, has a threaded engagement with the sleeve member. By this means both a quick action and a minute adjustment of the wrench is secured.

Rufus C. Smith, Ridgedale, Tenn. Shoe Stretcher.—The device relates to means for stretching or expanding shoes or the like. Briefly stated it consists of correspondingly shaped levers adjustably pivoted at their central portions, the ends being of different shapes, and being disposed in angular relation. A bolt is arranged to connect the adjacent arms of the levers so as to swing them toward each other, and the other arms outwardly, the latter arms being of course introduced into the article to be expanded.

Jeremiah R. Knapp, inventor, Norwalk, Ohio; Samuel C. Tyler, assignee, Eaton, Ohio. Game Board.—The invention consists of a centrally arranged transversely disposed concave playing field having transverse grooves provided with pockets. Alleys are located at the sides of the field, and are divided therefrom by longitudinally disposed bars, elevated above the surface of the board and defining the field and alleys. A longitudinally disposed partition is located in one end of each alley, and a return spring is arranged in the opposite end. A large ball is placed in each of the alleys, and a smaller ball coacts therewith, the smaller one being arranged to pass beneath the longitudinal bars into the playing field. Cues are provided for projecting the balls. These balls are so arranged that when both are projected, the larger balls are returned by the springs, and throw the smaller ones laterally beneath the said bars into the grooves of the playing field; and the pockets that the smaller balls enter, determine the amount of the score.

Jeremiah R. Knapp, inventor, Norwalk, Ohio; John W. Risser, assignee, same place. Sled Propeller.—This patent covers a broadly new idea in sled propellers, whereby a child seated on the sled can propel himself in any direction, a good deal after the manner of hand-propelled wagons. On the opposite side of the sled are slidably mounted bars, carrying surface engaging spurs. Hand levers are fulcrumed on the sled, and have detachable link connections with the bars, so that by oscillating the levers the bars are drawn forwardly. Springs are employed for moving the bars rearwardly, the spurs engaging the surface during the rearward travel of the bars and thus urging the sled forwardly.

Louis Edward Murphy, Jacksonville, Fla. Lubricant Conserver.—The invention is designed to effect a saving of lubricant, and is employed in connection with steam turbines. A case, within which the rotary wheel is placed, has pockets formed inside the bearings for the wheel shaft. A closed lubricant-receiving vessel is arranged outside the case, and has a valve outlet and a valve vent. Lubricant-conducting pipes lead from the pockets to the vessel, and have valves for controlling the same, while a valved equalizing pipe is preferably employed for connecting the vessel to the interior of the wheel case. By this means, the lubricant from the journals enters the pockets, and thence gravitates into the vessel where it may be drawn off, thereby avoiding its waste and passage to the boiler.

Edmund Roenius, Grand Rapids, Wis. Two patents.—Both of these patents relate to chutes, arranged to be placed in walls, for conducting wood and coal into the cellars or vaults. The first covers a chute that consists of a metal tube, on the outer end of which is hinged a cover. A hook pivoted to the cover engages over one end of the tube to lock the cover in closed position, and a detachable closure for the inner end of the tube secures the hook in locked position.

The other patent covers a different type of structure. An annular casing is employed that is arranged to be set within a wall at an inclination, and has a hinged cover, which when open, constitutes an extension. The cover has side wings that swing inside of the chute, and the inner end of the casing is provided with pivoted dogs that engage with the wings to lock the chute in closed condition.

Nathan Blair, Buell, Oregon. Sawing Machine.—This machine is portable, and can be applied to any log or timber to be cut. It consists of a frame, which includes a pair of spaced curved guides having a ground support adjustably connected to one end, and adjustable timber-engaging means mounted on the other end. A hanger frame is located over the guides, and a hanger, suspended from the frame, has a roller operating between the guides. A spring is connected to the hanger contiguous to its upper end, and a reciprocating saw has a novel connection with the lower end of the hanger. With this machine, one man can readily do the work of two.

Frederick Kruschke, Berlin, Wisc., inventor; Herman O. Kruschke, Peet, Wisc., assignee. Music Chart.—The device is intended to be placed on a piano or organ for showing the keys to be played in producing chords and harmonies, and it consists of a strip having horizontal parallel lines that divide the chart into independent horizontal sections. Characters are located in each of the sections and are disposed in series to point out certain keys which produce a harmonic chord. Upright lines intersect the upper sections of the chart and extend to the different characters. With this device, it is unnecessary to understand music in order to learn chords.

Thomas M. McIntosh, Fairfield, Iowa, inventor; Robert G. Murphy, Flanagan, Ill., assignee one-half interest. Egg Crate.—The object is to provide a knockdown box or case, which can be compactly folded so as to occupy little space. It consists of a bottom having side strips, to which are connected, by novel spring hinges and braces, the side and end walls. These side and end walls fold between the strips, and a detachable cover is arranged to be placed upon the walls when set up, being held by a binder that engages the braces for the side walls.





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**FOR SALE**—Patent No. 774,693, Steering Apparatus for Ships, dated Nov. 8, 1904; and patent No. 755,928, Heat Regulator, dated March 29, 1904. Address, John Peterson, Lake George, N. Y. jf

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## Scientific Farming.

Among the applications of modern invention—apart from those familiar in the development of great industries—the most interesting is perhaps that upon the farm, resulting as it does in counteracting the drift cityward which has been such a serious menace to our economic well-being as a country. The man who from choice of force of circumstances undertakes to manage a farm, will find himself much better equipped than his father was, not only with machinery, but with scientific discovery. The literature that satirizes country life, and finds it rude and brutal, is no longer popular. Publishers say it does not pay. College boys are slowly turning to agriculture in preference to overcrowded professions, and there is a steady growth in agricultural instruction throughout the land. Improved roads are rendering communications easier. Lack of neighbors is no longer a serious difficulty, as the country houses are being linked in the chain of rural telephones. The Man with the Hoe is now the man rising from his knees to stand erect.

An occupation, indeed, that has produced such an unthinkable value as one aggregating nearly \$5,000,000,000 within a year, may be concluded to be worthy of attention. The product of our farms last year exceeded six times the amount of the capital stock of all our national banks, and was two and a half times larger than the gross earnings from the operations of those huge money-making concerns, our railways.

No more significant change has taken place in American agriculture than the substitution of motive power of different kinds, for animal traction. The use of the automobile instead of the horse on country roads, the employment of gasoline, steam, wind and electric power to operate mowers, threshers, plows, feed cutters, corn huskers and dairy machinery, are characteristic of the new epoch. There is made and sold in this country each

year fully \$100,000,000 worth of farm machinery. What this means in the amelioration of labor conditions is beyond the power of words to describe. Most of the really severe work of the country can now be accomplished by mechanical agencies.

The successful farmer has more use for scientific knowledge than any other citizen. To thrive on the land, one must know what the land is, and he must have that understanding of plants and animals that is practical for everyday life. And it is just here that the up-to-date agriculturist reaps the advantages of modern discovery. He knows how to make rich soil out of poor sand or solid clay; how to draw nitrogen from the air, by means of certain legumes, so as to fertilize his land; how to find if the earth is in an "unhealthy" or acid condition, and how to apply the cure; how to eradicate weeds, or to make a friend of the enemy by developing useful products from it; in short how to control and protect his crops to a degree never before believed possible.

Among the recent revelations of science are those in regard to the breeding and hybridization of plants. Hardly an important fruit or vegetable can be named, that has not, in the last fifty years, been greatly improved by hybridization. Progress has also been made with the cereals and forage crops, by increasing yield and resistance to drought and disease. Corn and certain vegetables are now bred as carefully as are animals. By selection, corn can be made to produce at will, long ears, short ears, close kernels, regular kernels, full and fat kernels, oil, protein, or a minimum of kernel and a maximum of cob—the latter for use as pipes. The great cotton industry of the South, once threatened by the weevil, has found protection in a special variety of cotton, which has developed an internal tissue that kills the larva. Several new citrus fruits have been discovered, among them an orange which is hardy enough to resist freezing, and is yet sweet to the palate; the citrange, the tangelo, and other hybrids are valuable for marmalades. New apples, pears, grapes and nuts are being produced. The largest profits in commercial fruit growing frequently result from judicious planting of comparatively unknown varieties which shows adaptability to particular regions, or to special uses, before these points have been established by experience.

These are but a few of the recent remarkable results of scientific investigation. Our power to modify plants according to our needs has been greatly increased and perfected by the development of plant physiology; and our comprehension of the nutritive requirements of plants has enabled us to increase the fertility of our soils, to enlarge our harvests, to prevent waste of valuable food elements, to remedy disease and to improve nature's machinery for the accumulation of nitrogen from the atmosphere in combination available to crops. The consequence is that scientific farming is now becoming one of the safest forms of investment of capital and labor.

## The Advance in Transportation.

It is an impressive historical fact, the significance of which is not generally realized, that up to the time of our grandfathers, the world had made progress in every direction rather than in that of transportation. The races of mankind had spread over the habitable globe; strong governments were established; the institutions of society had acquired strength and permanence; inductive science had laid firm grasp upon the secrets of nature; great inventions and discoveries had widened the fields of activity, furnished the means and incentive for multiplied vocations, and opened up vistas of advancement in every direction. But this splendid and developed civilization, of little more than threescore years ago, was dependent for means of conveyance upon the ox and horse, the oar and sail. The highly organized social and industrial structure employed, as agencies of transportation, practically the same means as those used by the Argonauts when they set forth to find the Golden Fleece, or by Pharaoh when he urged his chariot after the fleeing Israelites.

The advent of steam as a mode of transport was not only a marvelous event in the history of mankind; it wrought an immediate and radical change in the elemental need of society, the means of distribution. The conditions of commercial intercourse were abruptly and fundamentally altered. No other triumph over the forces of nature compares with this in its influence upon human environment.

In pointing out the above, the vice president of the American Association for the Advancement of Science, at an address before the recent convention in New Orleans, adds the further fact, of no less importance, that the new methods of transport are not only incomparably superior in speed, cheapness and capacity to those they have supplanted, but they are capable of indefinite increase and expansion. The maximum efficiency of an animal is so well known as to amount to constant quantity, which is used as a unit of power. Now, a most suggestive feature of transportation by steam, electricity and other kinds of mechanical force, is that its capacity is not only unmeasured, but will doubtless prove to be practically inexhaustible. No certain limits can be assigned to the operation or effect of these new agencies. Speed may reach many times the rate now attained, and the cost of carriage for the longest distances be reduced to an astonishing minimum.

Coincident with this sudden transfer from animal power to steam have come new and amazing means of transmitting intelligence. In a brief generation the barriers of time and distance, hitherto so formidable, have been swept away by telegraph and telephone. All lands and people are held within the sphere of instant intercourse. Some interesting comparisons were given by the speaker. Eighty years ago it took a week to send a letter, and cost \$125 to move a ton of freight from Philadelphia to Pittsburg. The average price for carrying the

necessaries of life was not less than twenty cents a ton for each mile of distance. On such a basis most commodities were shut off from distant markets, and farm products, for example, would seldom permit of conveyance more than 100 miles. Nowadays, for all the practical needs of life, Manila is nearer New York than was Montreal a century ago, and the whole world could be easier governed from Washington today than could the United States when the capital was located on the Potomac.

Our grandparents got their supplies in the neighborhood where they resided, and only a few persons were concerned in their production. Today it may be said that five million people and five hundred million of capital are directly or indirectly employed in furnishing a family dinner. When merchandise of all sorts is moved from one end of the land to the other at an average cost of less than three quarters of a cent per mile, the expense of transport is but a trifling impediment to the widest distribution.

But, although the employment of steam and electricity as instruments of communication has brought immeasurable gains and has been followed by half a century of unparalleled progress, these manifold benefits have not been secured without serious evils. The potent energy which produced such prodigies of utility and convenience has generated an array of forces which already test the structure of modern society. Industrial strife has become world-wide and distance an ineffectual barrier against its destructive assaults. New economic problems have arisen, and the future alone will see their solution.

## Telephones in Church.

The latest use to which the telephone has been put is in the church, where the deaf are to be made to hear. A congregation in Baltimore numbers among its members upwards of a dozen persons who through deafness have been unable to hear the sermons of their pastors. By the aid of modern science, they can now distinguish even the lowest tones, and every word is brought to them with a distinctness which they had thought impossible. This seeming miracle has been wrought by the installation of the acousticon, a private telephone service running from the pulpit to the pews of the afflicted persons.

A receiver and sound magnifier are placed on the pulpit, with a four-cylinder dry cell battery below. This is connected by lines with the various pews, and the system is ready for use. It is impossible to detect the presence of the wires in the building. The receivers are about the size of a watch, and are hardly noticeable. Every part of the big sound magnifier on the pulpit is black, which harmonizes with adjacent colors. The minister in reading the service or delivering the sermon stands directly in front of the receiver, and his tones as they pass through the transmitter gather volume until, when they reach the ear of the listener, they have become so magnified that any one not completely deaf can hear without an effort. The experiment in this church has been so successful that the example will doubtless be followed by other congregations.



## SCIENTIFIC

## PROGRESS.

**Artificial Pumice Stone.**

Aside from its use as a cleaning agent, pumice stone belongs to the most important polishing substances. What emery is for tools, oxide of iron for glassware, lime for metals and polishing paper for stone, pumice is for softer articles. The stone as found in nature is nothing but lava, the foam-like porosity of which is due to the fact that the volcanic substance was cooled very rapidly through the development of gases. Natural pumice stone is of little firmness, and for that reason experiments have been made for some time to find an artificial substance of greater durability. This seems to have been accomplished through an invention by which artificial pumice stone is made by mixing sand and clay.

This artificial stone is prepared in five different forms. The first is either hard or soft, with a coarse grain, and is employed for leather, for water proof garments, and in the felt and woolen industry. The second, which can also be supplied hard or soft, has a medium grain, and is mainly utilized for stucco and sculptural work. The third is soft, of fine grain, and is recommended for polishing wood and tin; the fourth is of medium hardness, and gives to wood the right polish before being finished with oil; the fifth is hard and of fine grain, and is used for polishing stone, especially lithographic stone. The manner of using is the same as with natural pumice stone.

**Asbestos and Its Uses.**

New uses are constantly being found for that most unique of minerals, asbestos. Different from every other material in its occurrence, mining and preparation for the market, it forms an entire study in itself. When first mined, about a hundred years ago, it was thought to be of little or no commercial value, and was considered chiefly as interesting to the geologist. Shortly after the Civil War, it came into use in the manufacture of roofing felt and cement. Early attempts to spin the fiber were unsuccessful, but the difficulties have been overcome so that now a single asbestos thread, weighing not more than one ounce per 100 yards, which has a fair strength, can be made. This thread is employed for packing valves, etc., for which use it has obvious advantages.

Asbestos ropes for fire departments are made entirely of the mineral, or of asbestos with a core of steel. Firemen employ asbestos in a score of ways: and its uses for gloves, stove mats, lamp wicks, theatre curtains, cloth, in the construction of iron safes, etc., are well known; but a new method of utilizing it has just developed. It appears that socks made of asbestos are of advantage for soldiers. An army physician declares that the marching ability of the troops, which is the most important requirement for a regiment in the field, is less endangered by fatigue than through the sensitive-

ness of the skin of the feet against leather. This sensitiveness, which has always been recognized, the doctor thinks can be avoided through providing socks, or lining the soles of the shoes, with asbestos. It is said that the War Department of Austria is considering the adoption of this innovation, and that a test of it will be made at the next manoeuvres.

**New Uses of Wireless Telegraphy.**

Experiments have demonstrated that wireless telegraphy on moving trains will render valuable service in preventing accidents. It is stated by competent authority that a large proportion of recent railway horrors would have been averted had the trains been supplied with an apparatus for receiving wireless messages. The Prussian railway managers have been making tests with wireless telegraphy on moving trains. On a certain line each station is supplied with a sending and receiving apparatus, as are also the trains. For the transmission of signs, the telegraph wires along the road are used, in order to save electric energy. These trials have clearly shown that the apparatus on the train can communicate at all times with any station on the line, and report instantaneously irregularities, accidents, etc. Private telegrams can also be sent calling for help, notifying relatives of passengers waiting at stations, etc. On the other hand—what is of even greater importance—telegrams from stations can reach the moving train and warn the locomotive engineer against collisions, impediments on the track, and other dangers.

Portable wireless telegraph stations are now manufactured of such light weight that carts or wagons are no longer needed for their transportation, the parts being carried by the men. With stations moved by wagons, the air conductors are attached to balloons or kites: with portable stations, they are attached to steel masts. These masts—three in number—can be pushed together like a telescope, and are then about 12 feet long, but can easily be pulled out to a length of 33 feet. Owing to their light weight, which for one mast, inclusive of braces and wire rope, is only 44 pounds, they can be put up in short order. They are supplied at the foot with cast iron ground plates, and twice steadied, in three directions, by means of wire ropes fastened to ground anchors. Between the three masts, zinc-coated copper ropes, consisting of eight twisted wires, are stretched as air conductors. The ropes are fastened to the masts by brass hooks, with light glass insulators.

The electric energy required is furnished by a so-called "tread dynamo," mounted upon a sort of stationary bicycle with a light seat for the man who keeps the machine going with his feet. The weight of this dynamo is 44 pounds. The electric energy can also be supplied by a portable storage battery. For the transportation of the complete wireless telegraph station with a dynamo, ten men are required: with a storage battery, eleven men.

So far these stations, on account of the limited height of the masts, can only be operated on level lands for fifteen or sixteen miles, but they can be easily moved, quickly put up, and worked with certainty.

Another novel use of wireless telegraphy is reported in Austrian papers. Professor Reithoffer, of the Vienna technical high school, who is considered an authority with reference to the wave theory, has submitted to the city council a plan for an electric system of clocks run by wireless electricity. It is proposed to furnish the chronometric and electric apparatus, including clocks to the city, free of charge, and to make the trials. The city has only to furnish the current, the cable connects, etc., and give the use of suitable buildings. The council has appropriated \$600 for making these experiments. If they should lead to the adoption of the project, Vienna would be the first municipality in the world to have a system of electric clocks regulated by wireless connection.

**Photographs by Wire.**

Ever since spoken words came to be transmitted by electricity over long distances, the idea of performing the same service for visual impressions has been constantly dreamed of. Several inventors have endeavored to surmount the stupendous difficulties which the problem presents, and recently Professor Korn, of Munich, has produced a complete apparatus with which he has obtained some very promising results over considerable distances. The apparatus is an elaboration of an older method, and depends for its working upon the variation in the electrical resistance of a ribbon of selenium produced by variations in the intensity of a beam of light impinging upon it.

The photograph to be transmitted is produced in the form of a flexible transparency, which is wound around a hollow glass cylinder. This cylinder is revolved slowly and regularly, and at the same time is moved from right to left, with a screw-like motion. Inside the cylinder is a selenium cell with suitable electrical connections: outside is an electric lamp with a lens, from which a ray of light is thrown upon the transparency through a narrow slit. Every portion of the photographic image comes in turn under this slit, and as the ray of light reaches the interior of the cylinder, it is brighter or darker, according to the coloring of that particular part of the photograph through which it passes. The selenium within the cylinder transmits the electrical current in proportion to the intensity of the light brought to bear upon it—rapidly in a bright light, and slowly as the light decreases. This selenium is connected with the wire over which the photograph is to be transmitted.

The most distinctly novel part of the apparatus is the receiver. The varying current coming through the transmitter affects a galvanometer, whose finger moves nearer to, or farther from, a fixed point in proportion to the intensity of the current. Across this varying gap a high-po-

tential current is led, and caused to illuminate a Geissler tube of special construction. The brilliancy of the light within the tube varies in proportion to the distance between the finger of the galvanometer and the fixed point; and that distance, as already noted, varies with the density of the particular part of the transparent photographic image presented to the source of light at the other end of the line. A cylinder at the receiving end has another sensitive photographic film wound around it, and this is caused to revolve, and illuminated in sections, like the cylinder at the transmitter. The exact shade of the original photograph is thus produced, provided that the cylinders at each end of the wire revolve at exactly the same speed. The professor has ascertained a simple means of regulating the revolution of cylinders so that the speed is identical at both ends.

Experiments have been made with this apparatus on the telegraph line from Munich to Nuremberg, a distance of about 100 miles, but the professor declares that precisely the same results would be obtained if the photographs were transmitted by a telegraph line or submarine cable 5,000 miles in length. With the aid of a few technical improvements, suggested by the practical working of the apparatus, it is believed that a photograph six inches square can be transmitted within a minute. This is another important step toward the annihilation of space that characterizes modern civilization.

**Digging Under Water.**

The digging of a ditch under water is less spectacular, but no less interesting, than engineering feats above ground. When it is found necessary to deepen the channel into our great sea ports so as to accommodate the growing commerce, great twin-screw hulks of steel, built much like long rectangular boxes, with vertical stack, foremast and mainmast, steam into the course and lower big suction tubes. These are sunk into ten feet of the mud of the bottom. The pump is charged and the earth begins to run into the hoppers that extend for a hundred feet through the centre of the dredge. The boat moves forward at the rate of some 25 feet a minute, so that new material may be fed constantly into the hoppers by the suction. The men who are digging this trench from the ship's deck have only to see that the machinery is kept running. The boat itself does the actual work, filling itself and discharging its own load. When all the hoppers are filled, the tube is drawn up, the pump stopped, and the boats steam out to sea to dump their cargo. At the dumping spot, the compound pumps are started which supply water to free the discharge valves of the mud and sand. The valves are opened about three feet by hydraulic power, and a pressure of 60 pounds to the square inch aids gravity in clearing the hoppers. Meanwhile the suction pipe is lowered into the water, the pump is started, and the system of pipes and hoppers is washed clean and made ready for another burden.



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 Cash carrier ..... C. L. Swezey  
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 Coffee cutting mill ..... E. C. Smith  
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 Coin receptacle ..... W. H. Woolums  
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 Connecting rod ..... J. F. Cook  
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 Corn holder ..... A. N. Gitterman  
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 Crate or coop ..... E. Sperling  
 Cravat or tie holder ..... R. Riethmuller  
 Cream separator ..... C. Walker  
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 Cne rack ..... N. B. Stone  
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 Cupola ..... F. N. Cline  
 Current motor ..... F. B. Marvin  
 Curtin rod ..... A. Eichinger  
 Curt in rod support ..... F. L. Lathrop  
 Cutter head ..... F. D. Hall  
 Cylinder cooling device ..... C. H. Blomstrom  
 Dental tool ..... C. P. Fritz  
 Digging holes ..... I. D. Kemmerer  
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 Display rack for rugs, curtains and similar articles ..... F. W. Pierce  
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 Door. Gravity drop ..... J. M. Goodwin  
 Door hanger. Sliding ..... F. H. Lange, Jr  
 Door lock ..... W. W. Fessler  
 Door stay. Screen ..... E. Anderson  
 Draft equalizer ..... T. C. Lamouneux  
 Draft excluder and lock. Combination ..... W. Potter  
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 Dress shield ..... L. Lockie  
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 Engraving machine ..... E. Terrell  
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 Eraser. Rubber ..... E. Branns  
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 Fabrics. Apparatus for treating textile ..... O. Obermaier  
 Fan. Power ..... G. W. Weiss  
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 Fifth wheel ..... W. A. Schleicher  
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 Filing folder ..... C. R. Evans  
 Filing machine ..... M. W. Jones et al  
 Filing carrier ..... F. E. Kip  
 Film developing machine ..... A. V. Lindquist  
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 Fine stop ..... M. B. Lee  
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 Fruit clipper ..... H. H. Petty  
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 Furrow smoother and packer.....C. B. Smith  
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 Gas heater.....L. F. Knoderer  
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 Gate.....J. F. Struthers  
 Generator controlling device.....J. F. Struthers  
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 Governor Engine.....R. H. Pascall  
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 Grain drill tube.....H. C. Ham  
 Grain separator.....G. E. Holliday  
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 Grain, Steaming.....E. F. Kiler, Sr  
 Grate.....G. E. Travis  
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 Harness checking system.....J. Curtin  
 Harrow disk connection.....J. M. Stewart  
 Harvester and husker, Corn.....J. A. Stone  
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 Hat blocking and shaping machine.....C. Eickemeyer  
 Hat fastener.....H. I. Clark  
 Hat frame making machine.....W. Stoll  
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 Hay press.....W. E. Fisher  
 Heat applying device.....W. J. O'Donnell  
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 Ladder and ironing board, Combined step.....A. Scott  
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 Lantern, Tubular.....E. C. Everett  
 Lap board or sewing table.....K. M. Moore  
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 Leaf turner.....F. G. Lavin  
 Ledger system, Extended.....F. W. Briggs  
 Level, Spirit.....J. Martin  
 Lifting hook.....L. L. Davis  
 Light, Producing.....P. C. Hewitt  
 Line holder.....T. A. Seitz  
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 Malt stirring apparatus.....J. F. Dornfeld  
 Mantle suspension.....C. M. Lungren  
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 Shelf support.....J. Speed  
 Ship, Swing bed for use on board.....C. Soulas  
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 Sound reproducing and magnifying means.....J. L. Gray  
 Sound reproducing machines, Pitch indicating attachment for.....C. L. Chisholm  
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 Still, Wood.....H. Copilovich  
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 Stove or furnace.....H. J. Hough  
 Strap.....S. T. Roberts  
 Stringed instrument key.....A. A. Farland  
 Suture bridge.....J. E. Chambers  
 Switch.....W. W. McClung  
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 Table attachment, Extension.....H. C. Kriehbaum  
 Tabulating and other like systems, Apparatus for use in.....H. Hollerith  
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 Tank.....J. W. Wallace  
 Tap and die holder.....C. E. Cole  
 Target, Self registering electrically operated sectional.....G. A. Peters  
 Teeth, Instrument for stopping.....P. F. Rutterford  
 Telegraphic safety device.....S. R. Wright  
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 Tools, Portable apparatus for transmitting motion to.....A. Collet  
 Top, Spinning.....W. Whitfield  
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 Truck, Folding.....W. F. Markham  
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 Valve, Automatic balanced.....F. H. Mason  
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 Valve for gas burners, Regulating.....L. F. Knoderer  
 Valve for pipes, Relief.....F. Trump  
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 Vehicle body bolster.....J. M. Goodwin  
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 Vehicle fender or obstruction remover for road vehicles.....P. Arrieta y Sanz  
 Vehicle frame construction.....J. M. Goodwin  
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 Vehicle girder and bulkhead.....J. M. Goodwin  
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 Wagon, Dumping.....C. Miller  
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 Waistband, belt and the like E. Abadie-Leotard  
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 Washbench and step ladder, Combined.....C. E. Emory  
 Washing machine.....J. V. De Silveira  
 Watches, Banking screw for.....C. E. De Long  
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 Water heating attachment.....G. E. Dixon  
 Water jacket.....C. W. Hawkes  
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 Wrapper for salesman's slips, &c.....J. H. Rand  
 Wrench.....W. D. Garrard  
 Yoke, Neck.....C. A. Smith  
 Zinc, Battery.....H. J. Brewer

## DESIGNS.

Badge button.....V. M. Ellis  
 Badge or similar article.....J. B. Goodwin  
 Cabinet top, Kitchen.....W. C. Horner  
 Dish or similar article, Covered.....C. J. Abrenfeldt  
 Fabric, Printed textile.....E. B. Vandergaw  
 Lamp housing, Arc.....A. Hausold  
 Plate or dish.....A. A. Robineau  
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 Tool handle.....J. E. Wood

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Accounting appliance, Credit.....J. J. Bennett  
 Acetylene generator.....J. W. Vaughn  
 Adding device, Mechanical.....C. R. Martineau  
 Addressing machine.....A. B. Hunkins  
 Advertising device.....H. B. Seaman  
 Agricultural implement.....W. H. Rice  
 Air brake coupling, Automatic.....V. Simecek  
 Air feeding device.....W. Sasse  
 Alarm.....H. Irwin  
 Alcohol from liquor casks and barrels, Apparatus for recovering waste.....T. H. Naughton  
 Alcohol from liquor casks and barrels, Recovering waste.....T. H. Naughton  
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 Alkylaminoacetopyrocatechol and making same.....F. Stolz  
 Alloy of iron and hydrogen agglomerated in strong coherent bodies, Production of articles of.....G. W. Gesner  
 Anchor.....O. Hile et al  
 Animal trap.....J. Walker et al  
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 Arch prop.....J. W. Arrcwsmith  
 Article holding means.....D. King  
 Assembler slide brake.....L. F. Smyth  
 Atomizer or nebulizer.....F. C. Dormant  
 Automatic switch.....C. F. Adams  
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 Automobile sleighing attachment.....C. C. Dolan  
 Automobiles, Device for recharging the storage batteries of.....L. Lyndon  
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Blank..... G. W. Heene  
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Bobbin..... C. C. Cost  
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Boot and shoe filler..... A. Lewis  
Boot and shoe shank piece..... W. H. Baynard  
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Bottle locking device..... E. F. Strobel  
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Display form..... W. S. Stillman  
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 Tire shrinking machine..... D. O. Brackett  
 Tire vehicle..... J. K. Williams  
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 Tubular articles. Machine for shaping..... N. Marshall  
 Tug or support. Shaft..... J. O'Connell  
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 Turbine governing mechanism..... D. Hurley  
 Turning and boring articles, such as spools, &c. Machine for..... H. K. Stockwell  
 Typewriters. Adjustable line predetermining device for..... C. A. Shea  
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 Typewriting machine..... B. C. Stickney  
 Typewriting machine..... E. F. Kunath  
 Typewriting machine adding device..... C. R. Martineau  
 Umbrella..... E. W. Crane  
 Valve. Air brake..... W. O. Gunckel  
 Valve. Expansion..... A. H. Eddy  
 Valve for air compressors..... T. E. Sturtevant  
 Valve gear for explosion engines..... L. P. A. Baileul  
 Valve. Steam engine..... D. J. Hoisington  
 Vehicle draft connection..... A. T. Sutson  
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 Vehicle wheel..... R. F. Martindale  
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 Vibrator controlling means..... W. F. Molt  
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 Wall covering..... H. L. Messmore  
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 Window cleaner..... H. Beatty  
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 Window lock and gravity bolt..... A. H. Woodruff  
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 Wrench..... W. C. Lott  
 Wrench..... J. A. Flindall  
 Yoke. Cultivator..... A. G. Lindgren  
 Zinc sulfate solution into zinc oxid. Apparatus for converting..... C. E. Dewey

## DESIGNS.

Bottle..... A. Andresen  
 Button. Lapel..... E. Gebhardt  
 Carpet..... A. M. Rose  
 Carpet..... W. L. Jacobs  
 Carpet..... 2 pats..... J. S. McNab  
 Condiment container..... F. E. Burley  
 Curtain..... E. F. Boubel  
 Grape fruit holder..... F. E. Burley  
 Mug. Wooden..... R. P. Spooner  
 Plate..... E. J. Owen  
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 Stove. Cooking..... E. C. Cole  
 Water receptacle or bottle..... I. Newell

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 Animal chase..... W. M. Elder et al  
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 Animal trap..... C. C. Lapham  
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 Automatic carrier..... S. H. Libby  
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 Battery..... E. W. Schneider  
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 Book support..... F. E. Ruger  
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 Bracket..... A. R. Ferguson  
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 Bucket or conveyer..... W. F. Jones  
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 Bur. Loop unifying and cast off E. Tompkins  
 Burglar alarm..... J. A. Dillen  
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 Button making machines. Gripping device or carrier for..... J. Hornby  
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 Calculating machine and type writer attachment..... H. Hanson  
 Can opener..... W. T. Seerup  
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 Cans. Handled head for sheet metal..... C. Sherman  
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 Candy machine..... W. J. Morrison  
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 Carton making machine attachment..... R. Sniderman  
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 Chair lounge..... J. Flindall  
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 Chime ringing apparatus..... A. E. Adriance  
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 Cider press..... J. S. Wintner  
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 Cigarette making device..... A. E. Buckingham  
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 Clod crusher..... J. W. Dalrymple  
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 Cock. Self closing basin..... J. A. Johnston  
 Coffee and cereal roaster..... K. H. Rommel  
 Collapsible table..... C. R. Sheldon  
 Collar pad. Horse..... W. F. Sachse  
 Column cap and base. Combined..... J. Lally  
 Composite construction. Tension member for..... J. Kahn  
 Concrete. Apparatus for lining tunnels with..... J. W. Reno  
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Conveying apparatus..... C. H. Locher  
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 Cooler, cream ripener and pasteurizer. Combined..... D. W. Payne  
 Coop. Folding chicken..... C. J. Laidig  
 Copying press. Letter..... G. H. Taylor  
 Cord fastening device..... D. A. Wedmore  
 Coupling..... H. C. Clay  
 Coupling device..... A. E. Scouten  
 Crate. Folding..... F. J. Hipp  
 Cream separator. Centrifugal..... F. A. West  
 Culinary vessel..... H. McConnell  
 Cultivator..... T. Mulally  
 Cultivator..... F. E. Schaal  
 Cultivator, road machine and farm wagon. Disk land..... A. L. Foote  
 Current generator. Alternating..... C. P. Steinmetz  
 Curtain and counterbalance for book and other cases..... A. McKenzie  
 Curtain holder..... G. W. Barnett  
 Curtain pole..... J. N. Mills  
 Decorticating machine..... M. Castellon  
 Dental tool holder or clutch..... B. S. Brown  
 Desk. School..... W. H. Stockman  
 Diaper..... R. H. Peters et al  
 Disappearing seat..... S. M. Curwen  
 Display apparatus. Illuminated..... F. M. D'Arzi  
 Display can or box. Sheet metal..... E. M. Hallbauer  
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 Door..... F. K. & A. M. Eastman  
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 Dredging apparatus..... J. Hamilton  
 Drill shanks. Equalizing weight feed for..... K. Brooks  
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 Driving mechanism. Variable speed..... W. L. Schellenbach  
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 Dry closet..... T. Macfarlane  
 Duplicating machine..... H. C. Gammeter  
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 Dust collector and separator..... A. C. Lynch  
 Dynamic trap or drain valve..... J. F. McElroy  
 Easel..... J. B. Thompson  
 Edge trimmer..... J. A. Gates  
 Egg boiler. Time..... H. H. Chesbrough  
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 Electric light socket and key..... O. C. Cover  
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 Electric machine. Dynamo..... C. P. Steinmetz  
 Electric meter..... W. H. Pratt  
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 Engines. Current controller for igniting devices for hydrocarbon..... F. O. Farwell  
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 Engraving machine..... W. S. Eaton  
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 Explosive engine..... T. J. Lutz, Jr  
 Eyeglass cleaner..... H. C. Fosberg  
 Fabrics. Adjustable guiding mechanism for skewing bridge threaded..... E. T. & E. H. Marble  
 Fastening device. Headed..... E. T. House  
 Faucet..... W. A. Speakman  
 Faucet and filter. Combined..... F. A. Dunham  
 Feeding device..... D. Collins  
 Fence making machine. Wire J. M. Denning  
 Fencing tie. Wire..... F. H. Benedict  
 Fertilizer distributor..... R. J. Taylor  
 Fibrous material and dyeing same. Blue..... V. Fussganger  
 Fifth wheel. Vehicle..... E. Lewis  
 Filaments and films from viscose. Manufacture of..... C. N. Waite  
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 Fire escape..... K. Pugh  
 Fire escape..... S. Z. Moore  
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 Fireproof and waterproof composition..... E. Covington  
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 Fish hook..... C. A. Shaw  
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 Flanging machine. Cap..... J. Brenzinger  
 Fleece carrier..... T. E. Ainley  
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 Ram, Hydraulic..... H. V. Blake  
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 Sealing bottles or similar articles, Closure for..... F. B. Thatcher  
 Sealing boxes, &c. Means for..... A. Freschl  
 Sealing device..... F. W. Parcell  
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 Sidewalk, floor and roof light construction..... P. H. Jackson  
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 Singeing machine..... H. Kraemer  
 Smoke stack..... W. G. Wallace

Soap Brush..... H. A. Burt  
 Sound producing instrument..... C. A. Parsons  
 Spectacles..... H. Newbold  
 Speed changing device..... O. F. Persson  
 Speed meter..... R. W. Hargrave  
 Spike puller..... D. Auer  
 Spinning frames, Curved fly remover for..... R. Obernesser  
 Spool holders, Combined weight and flier for..... A. H. Groel  
 Stamp mill..... 2 pats..... M. P. Boss  
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 Stove, Magazine heating..... E. D. Marshall  
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 Stuffing box..... J. Sieger  
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 Surgical clip..... A. J. Meier  
 Surveying instrument attachment..... W. M. Beaman  
 Swaging mill..... G. H. Blaxter  
 Sweat band..... R. H. & H. D. Curtis  
 Swingletree attachment..... W. C. Pritchard  
 Switch..... M. S. Farmer  
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 Talking machine horn support..... E. S. Oliver  
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 Teaching the fundamental operations with numbers, Device for..... C. Zahn  
 Telegraph receiving apparatus, Wireless..... A. Artom  
 Telephone and watchman's alarm system, Combined..... J. J. Berry  
 Telephone exchange system..... H. G. Webster  
 Telephone exchange system..... W. M. Davis  
 Telephone exchange system..... H. D. Stroud  
 Telephone exchange systems, Transfer circuit for..... C. A. Simpson  
 Telephone system..... C. B. Smith  
 Telephone time register..... G. Furst  
 Temperature regulating apparatus..... J. A. Serrell  
 Theaters, &c. Means for quickly emptying crowded..... L. Wittenberg  
 Tire..... C. W. Faltoute  
 Tire armor..... H. E. Prouty  
 Tire tool Vehicle..... C. McCarthy et al  
 Tire valve..... C. E. Duryea  
 Torch and soldering iron, Combined hand .. E. Block  
 Torch, Marine..... J. D. Graham  
 Torpedoes, Retarding device for automobile..... F. M. Leavitt  
 Toy bank..... C. A. Bailey  
 Toy, Inflatable..... C. A. Lindsay  
 Track brake..... J. M. Cook, Jr.  
 Track clearing device..... C. C. Battey  
 Traction increasing mechanism..... F. L. Sheldon  
 Transmission element, Frictional..... P. Sechiar  
 Translating device..... R. D. Kline  
 Tripod, Camera..... O. W. Steindorf  
 Trolley..... H. Zander et al  
 Trolley harp..... I. H. Lunt  
 Trolley pole..... A. S. Weaver  
 Trolley shield..... J. W. Brown et al  
 Trolley track, Overhead..... C. G. Schmidt et al  
 Trolley wire suspension, System of..... P. E. Herkner  
 Truck bolster..... J. M. Goodwin  
 Truck, Car..... J. A. Brill et al  
 Trunk tray support..... A. S. Belber  
 Tubes, Implement for truing the internal forms of..... F. A. Forwood  
 Turbine, Shaft..... F. Davis, Jr.  
 Turbine, Fluid pressure..... G. Westinghouse  
 Turbine guiding means..... H. Lentz  
 Turbine, Steam..... C. F. Barth  
 Turbine, Steam..... D. Lumgaire  
 Typewriters, Card holding device for..... J. C. McLaughlin  
 Type writing machine..... L. Ney  
 Type writing machine, reissue..... F. X. Wagner  
 Valve, Back pressure..... A. W. Cash  
 Valve Cylinder compression relief..... J. W. Miller  
 Valve Exhaust controlling..... W. J. Inman  
 Valve Flush..... E. D. Barrett  
 Valve for air brake systems, Pressure retaining..... W. Wilhelm  
 Valve for pneumatic tools, Throttle..... R. A. Norling  
 Valve mechanism..... J. A. Dyblie  
 Valve mechanism for gas engines..... C. M. Smith et al  
 Valve Throttle..... I. S. Chambers  
 Valves, Diaphragm for controlling..... J. B. Fulton  
 Vats, System of excavating and filling..... H. W. Blaisdell  
 Vault light..... J. McGuigan et al  
 Vehicle bearing spring Motor..... T. G. Stevens  
 Vehicle Dumping..... J. M. Goodwin  
 Vehicle heater..... J. F. Swengel et al  
 Vehicle Motor..... C. M. I. Periet  
 Vehicle running gear, Motor..... R. B. Vaughn  
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 Vehicle wheel..... R. S. Bryant  
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 Vehicles by fluid pressure, Apparatus for operating dnmolng..... J. M. Goodwin  
 Vending machine, Coin controlled..... S. L. Long  
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 Vise, Parallel bench..... W. H. Snow  
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 Wagon tipping device..... C. Pav  
 Wall tie..... G. H. Charis  
 Washing apparatus, Fabric..... I. E. Palmer  
 Washing machine..... C. O. Frostenson  
 Waste trap..... W. H. Lloyd  
 Watch..... A. Wagner  
 Watch, Remontoir winding..... F. Hartmann  
 Water, Apparatus for producing boiling..... H. Junkers  
 Water by electrolysis, Apparatus for decomposing..... W. F. M. McCarthy  
 Water closet..... J. Rhead  
 Water glass guard..... G. C. Jones

Water purifying apparatus..... J. H. McDonald  
 Weather strip..... F. Y. Dawson  
 Well drilling machine..... W. L. Knowles  
 Wells, Branch clamp for oil..... R. B. Nelson  
 Wheel gage..... R. L. Ervin  
 Wind motor..... J. C. Ziegler  
 Windmill governor..... P. B. F. Born  
 Windmill regulator..... F. E. Kronquest  
 Window..... D. R. Caler  
 Window construction..... W. H. Miller  
 Window lock..... J. Killmeyer  
 Window, Sheet metal..... V. Ross  
 Window stop and guide, Metal..... V. Ross  
 Wire fabric making machine..... W. N. Parrish  
 Wire stretcher and splicer, Combined..... A. & C. A. Church  
 Wood articles, Machine for shaping..... J. H. Neville  
 Woodworking clamo..... C. Gustavson  
 Woodworking machine..... F. Diehl  
 Wrench..... S. E. Coffman  
 Wrench..... C. C. Dotson  
 Wrench..... J. G. Wilson  
 Wrench..... W. H. Claflin  
 Wristlet..... W. E. Wolff

## DESIGNS.

Automobile body... 2 pats..... P. W. Steinbeck  
 Badge..... J. B. Goodwin  
 Barometer case..... E. Wolfstein  
 Eylet..... G. A. Langmaid  
 Fabric, Printed textile..... E. B. Vandergaw  
 Furnace front, Heating..... C. Smith  
 Gas globe, Incandescent..... S. Mason  
 Goblet..... A. Pick  
 Illuminator..... O. A. Mygatt  
 Ring..... E. J. Carr et al  
 Ring..... A. A. Dorst  
 Stove, Gas..... L. Stockstrom  
 Tool handle..... 4 pats..... J. J. Tower

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## LIQUID THAT DEFIES TIME.

## Discovery of Chemist Will Preserve From Rust and Decay.

The Hungarian chemist Brunn says he has discovered a liquid chemical compound which renders certain kinds of matter proof against the effects of time. He asserts that it doubles the density of nearly every kind of stone and renders it waterproof. It imparts to all metals qualities which defy oxygen and rust. It is also a germicide of hitherto unequalled powers. The professor says that while traveling in Greece some twenty-five years ago, he noticed that the mortar in stones of ruins, which were known to be over 2,000 years old, was as hard, fresh and tenacious as if it had been made only a year. He secured a piece of the mortar and has been working on it ever since until now, when, he says, he has discovered the secret.

The compound is a yellow liquid, which the professor has christened zorene. He describes the following experiments: A piece of ordinary and easily breakable slag after immersion in zorene defied the full blow of a hammer. There was the same effect on ordinary bricks and a block of red jarrah wood. All three were then immersed in water for a long time. When taken out and weighed with delicate scales, the presence of a single particle of added moisture could not be detected. Two pieces of steel submitted to an ammonia test equal to five years' exposure to the air, emerged from the bath as they entered it.

An ordinary table knife which had lain open five months did not show the slightest stain. Professor Brunn asserts that he will be able to make roads dust, germ and waterproof, thus giving commercial value to hundreds of millions of tons of slag which is now useless in the mining and smelting districts. His discovery will at the very least, he says, double the life of metals exposed to the air, such as in bridges, railroads, vessels and tanks.

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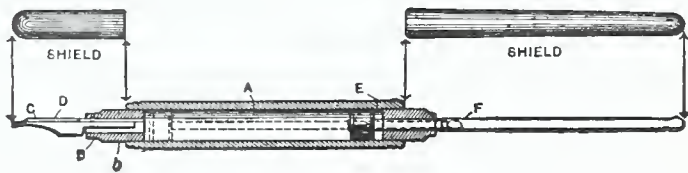


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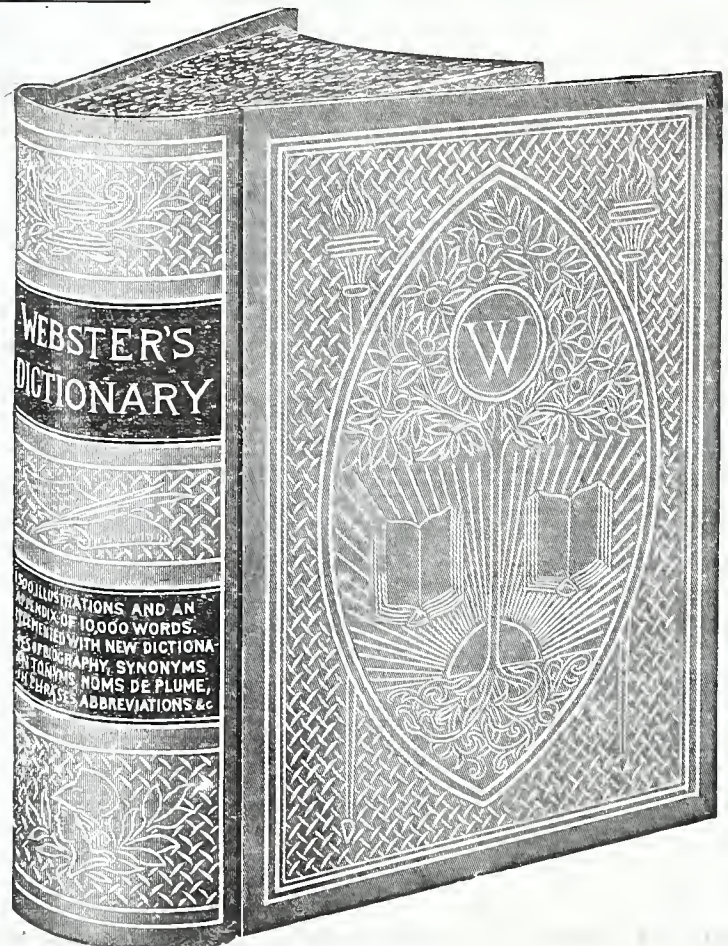
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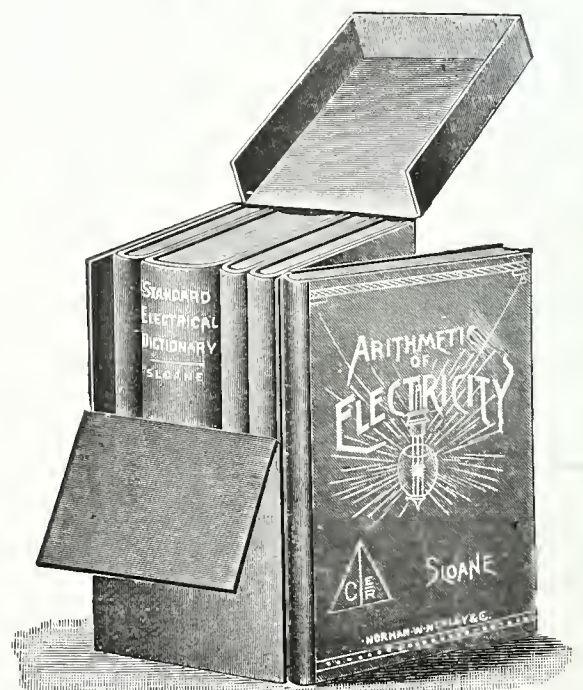
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## THE VICTORIA FALLS BRIDGE.

WHEN explorers brought word of a falls in the heart of Africa, twice as high as our famous Niagara and a mile in width, many people were incredulous. Yet so rapid is the progress of civilization, that though it was but a few years ago that these rumors first became current, the falls have already been reached by railway, the gorge bridged, and a hotel erected for tourists.

The completion of the bridge over the Zambesi river means that another link—and probably the most important—has been forged in the great scheme proposed and started by Cecil Rhodes, namely the Cape-to-Cairo railroad. In other ways the bridge is an interesting piece of engineering work, as it is the highest in the world, and the waters of the gorge which it spans (some 400 feet below) have never been fathomed, and no one knows their depth. Further, the usual engineering difficulties encountered in a task such as this have been intensified from the fact that it has been carried out in the midst of the Dark Continent.

The bridge, as it stands, represents a year's labor. It was shipped in sections from England, and erected on its remote site in this comparatively short space of time. The gorge, at this point, is some 650 feet in width. The bridge was built out simultaneously from each bank on the cantilever principle until it met in the center. To accomplish this, it was necessary to carry a large quantity of material to the other side of the stream. To get this across the river, an electric cableway was thrown across the gorge. Communication was first established between the two banks by firing a rocket across. To the rocket was at-

tached a line, by means of which a stronger rope was drawn across, and again a stronger one, until a steel wire rope, nearly three inches in diameter, was thrown over the site. This wire rope was supported at one end by a fixed tower, thirty six feet high, and at the other by a swinging post, 80 feet in length. To prevent this latter being pulled over by the cable into the gorge, a counter weight of 60 tons was attached to it. On the cable ran an electric machine, from which was suspended a cage, which carried men and

way played a most important part in the undertaking. In addition to carrying the weight of one half of the bridge across the gorge, all the material and rolling stock required for the construction of over fifty miles of railroad were also safely conveyed across the stream by the electric cable. Passengers were also conveyed across the stream in the cage, the journey occupying about four minutes.

The bridge, which is a combination of girder and arch, has a total length of 650 feet, and consists of three spans.

feet deep and 30 feet apart, and the two extremities joined together by boring through the rock. Wire ropes suspending the weight of each half of the bridge were passed down one hole, along the passage connecting the two, and out at the other, so that the weight was sustained by this solid mass of rock; and to make assurance doubly sure, a mass of 500 tons of rail was also piled on top of the rock. It was estimated that when the two halves of the bridge were on the point of meeting in the center, there was a pull of 400 tons

on each of the four corners, and as the bridge was built out toward the center, additional ropes were added to withstand the increased stress.

The curve of the main arch is parabolic, and is divided into twenty bays, each 25 feet long. The bridge has a clear width of roadway of 30 feet, sufficient for a double set of rails. A close inspection of the photograph will reveal the presence of a huge net, which was thrown across the chasm by two steel cables and was erected, so contractors declared, "to catch the boys and tools should they inadvertently drop into it."

An interesting fact in connection with the bridge is that it is located a little below the falls, on the borders of what is known as the "Rain Forest." During the rainy season the great



THE VICTORIA FALLS BRIDGE OVER THE ZAMBESI GORGE.

material across. The whole was controlled by the motorman from the platform of his machine, who could raise and lower his car at will. When it is remembered that the gap between the supports and the cable measured 870 feet, and the aggregate quantity of material that had to be transported across amounted to many thousands of tons, it will be seen that the cable-

On account of the weight of the structure—about 2,000 tons—it was necessary to tie it back to each bank in some way until a junction was made, as the bridge then, of course, would carry its own weight. The manner in which this was done may be said to constitute one of the most interesting features of the undertaking. Two bore holes were sunk on each bank, 30

volume of water dashing over the mighty chasm sends up columns of sprays to a height of 3,000 feet, which descends like rain for an extensive area, whose limit is variable and is governed by the force and direction of the wind. It was the wish of Cecil Rhodes that the bridge should be built so that the spray from the falls should shower upon the trains as they pass; and this desire has been fulfilled.



## A YOUNG GENIUS.

Hermann G. Pape, of Buffalo, New York, an inventor whose achievements in the electrical field have recently brought him into prominence, is a young man of modest appearance and pleasing personality. He was born in Germany, but came to America at an early age. As soon as he was able to work, he started in a shop where various electrical instruments were made. Later, he spent some time with a telephone company, in the meantime studying the constructions of magnets, telephones, dynamos and other electrical and magnetic instruments. He soon attracted attention by inventing an instrument known as the audiphone, by means of which the deaf could be made to hear the slightest sounds. The audiphone is an electro-magnetic instrument similar in some respects to the telephone, but much more sensitive and powerful. The claims for this instrument were so extravagant that the writer was decidedly skeptical until convinced by an actual demonstration. Two deaf mutes, acquaintances of the writer, but strangers to Mr. Pape, placed the ear pieces of his audiphone to their ears. The receiver, or that part of the instrument intended to receive the sound, was placed upon a table in the center of the room and the deaf mutes were immediately able to take part in the conversation of those in the room, responding in writing when addressed verbally. The delighted expressions on the faces of these unfortunates when the first words were spoken, were absolutely convincing.

After protecting his audiphone by a number of broad patents, Mr. Pape further developed the idea by devising an apparatus to facilitate the use of the audiphone for the instruction of the deaf. This apparatus comprises a table equipped with a number of ear pieces for the use of pupils, and with a receiver or teacher's instrument for the use of an instructor. By an ingenious arrangement of circuits and switches, the teacher is enabled to disconnect all other pupils when it becomes necessary to address conversation to a particular pupil. The apparatus is also equipped with individual receivers for the pupils, so that the latter when not engaged in class instruction, may practice speaking, the sound of their own voices being conveyed to them by the audiphone. It is a well known fact that most deaf mutes are speechless by reason of their inability to learn to talk, when unable to hear the sounds uttered by them. The Pape instruction apparatus is therefore a marvelous aid not only in imparting knowledge to those ordinarily unable to hear, but also in actually restoring the voice to those who have been mute from birth.

This development of the audiphone was naturally followed by inventions looking to the perfection thereof, as well as to the telephone, a number of patents being obtained for inventions for preventing reverberation in the ear

piece of the audiphone or in the receiver of the telephone, thereby rendering the transmitted sounds perfectly clear and distinct.

These inventions were followed by an automatic switch located in the handle of the receiver or earpiece. This switch is so arranged that the circuit is normally open, but as soon as the instrument is placed in position for use, the switch automatically operates to put the instrument in circuit. All of these inventions are of marked importance in the electrical art, and have attracted considerable attention; but Mr. Pape, like the great Edison, and other born inventors, is constantly striving for the unattainable, and follows the climax of each achievement by another of greater magnitude.



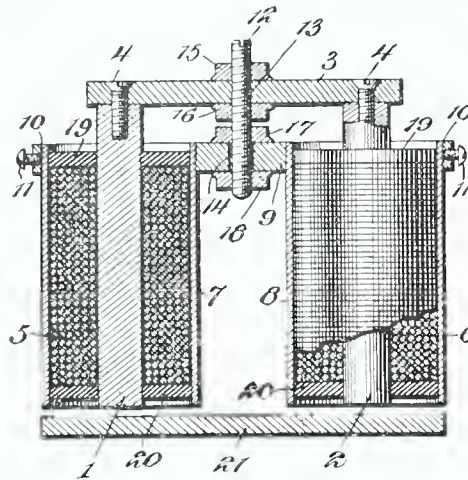
HERMANN G. PAPE.

His most recent invention, and the one which brings him into the public eye at this time, is an electro-magnetic device of unlimited possibilities. By a peculiar arrangement of a plurality of magnets and coils he has produced an electro magnetic device which vastly multiplies the energy ordinarily obtained from a given consumption of electrical energy. The confines of this article make it impossible to enter into a technical description of this device, but it may be said in general, that by a peculiar arrangement of several permanent magnets, all are energized by the same coils so that while the electrical energy consumed is no greater than it would be for a single magnet, the attractive power of the device is multiplied by the multiplication of individual magnets. In fact, it has been shown in an actual test that one of the Pape devices including two magnets exerts an attractive force greater than the sum of the attractive forces of the two individual magnets employed. The accompanying illustration is taken from the patent No. 812,445, which was procured through the office of E. G. Siggers, Washington, D. C.

Some idea of the immense power of this device can be obtained from the statement that the lifting power of a magnet including a pair of coils only

1 inch long by  $\frac{3}{4}$  of an inch in diameter, exceeds 25 pounds. It will be seen from this that it is impossible to estimate the importance of this invention in the electro-magnetic art, because of the vast number of relations in which electro-magnetism is employed as a motive force.

Mr. Pape believes that by constructing motors, dynamos, telegraph relays, etc., in accordance with the principle disclosed in his latest patent, the electrical propulsion of vehicles, both on land and sea, and the clear transmission of sound will be so greatly facilitated as to practically revolutionize present methods of rapid transit and of the transmission of sounds to great distances. He also points out that by reason of the great power which will be obtained from a motor of insignificant size, it will be possible to greatly improve the construction of automobiles. The extreme lightness and smallness of the motor will not only enable lighter and cheaper constructions to be utilized for the body and running gear of the automobile, but will greatly increase the space devoted to the comfort and convenience of the automobilists. As showing the enormous possibilities of an extremely light weight high power



THE MULTIPOLAR MAGNET.

motor, Mr. Pape points out that up to this time aerial navigation has been a practical impossibility because of the lack of a motor of sufficient power coupled with extreme lightness. The advent of the vapor motor promised much for aerial navigation; but while much has been accomplished, it is now an acknowledged fact that this type of motor, when built with sufficient lightness for aerial use, is uncertain and liable to frequent derangement when operated at the extremely high speed required for aerial navigation. Whether a motor constructed in accordance with the principle underlying Mr. Pape's electro-magnetic device, will bring about the immediate solution of the problem of aerial navigation, is a question which will soon be answered.

The use of the Pape system of serially co-operating magnets energized by common windings is quite as efficient for dynamo construction as it is for the construction of motors. It follows, therefore, that by the use of a Pape dynamo, a given unit of electrical energy may be developed by the application of one-half the usual power, while the electric-magnetic translation of such unit will result in the doubling of its effective energy. It will therefore be seen that theoretically, at least, the available power of

the motor will be approximately four times greater than is ordinarily available from a given unit of power applied to the operation of an ordinary dynamo.

While it would be impossible to enumerate the untold variety of mechanisms in which electro-magnetism is utilized as a motive force, and which are therefore capable of greater efficiency when constructed in accordance with the Pape principle, it may be stated that the latter opens an avenue of development in railway, marine, and aerial transportation, telephonic and telegraphic communication, electric lighting, heating and power installations, fans both portable and installed, electric time pieces, electro-magnetic instruments of precision, ore locators, etc.

It is evident from this brief review of Mr. Pape's achievements that he is not only a prolific inventor, but that his genius is intelligently directed along practical lines of development. This insures a continuance of his useful endeavor, and gives promise of a brilliant future marked by material achievements in his chosen field of research and development.

## Reclaiming Steel Scrap.

Steel has been called the talisman of modern industrial achievement. In view of the fact that it is the one thing necessary in the production of almost every article in modern daily use, from a giant steamship to a lady's watch, the utilization of pieces that have always been considered waste products, is of more than common interest. It is the usual idea that unless steel is forged, hammered into shape, or rolled, it has little more strength than cast iron. The common cast steel is more brittle than the forged product, and cannot be used where it is called upon to bear a great tension. By the new process, scrap steel that has outlived its usefulness, as it were, becomes regenerated. A worn out boiler plate or a broken fly wheel becomes a keen edged axe, or a swiftly moving steamboat walking beam. The same steel which can be produced cheaply enough to be used for a forty-ton casting in a battleship may be used, when treated, in practically the same way for tools requiring a very fine edge such as a carpenter's chisel, or one hard enough to cut other steel, like a cold chisel.

Forging, which is only a shorter word for hammering into shape, requires by the very nature of the process much time and skilled handling to produce a perfect result. In forging, the metal is squeezed into shape, either by repeated blows of a hammer or through hydraulic pressure. If the former process is used, great pains are taken and much time is lost; if the latter, very expensive dies are necessary to shape the metal while in its semi-fluid state.

In the new method, the scraps of steel are taken and re-melted, and the molten product is run into a mold, made out of sand by a wooden pattern, and when it has cooled, the piece is ready for the finishers. Most important of all, the quality of the two products are said to be the same.



## TRADE MARK BILLS UNDER ADVISEMENT AT WASHINGTON.

By Frank D. Currier, Chairman Committee on Patents, House of Representatives.

(Reprinted from *American Industries*.)

Several important trade-mark bills are pending before the House Committee on Patents. The purpose of two of these bills is to provide a penal remedy, similar in character to that found in the legislation of many of the states, for the wilful, fraudulent imitation of a trade-mark registered under the present United States statutes. One of these bills, H. R. 10,091, is known as the United States Trade-Mark Association bill, and the other, H. R. 13,942, is known as the American Bar Association bill.

The bills differ greatly in scope. The Trade-Mark Association bill is limited so as to cover only trade-marks used in interstate and foreign commerce which can be registered under the present law, and to protect them only against infringements which are used in the same way. The American Bar Association bill is far broader than this, and seeks to make criminal the intentional counterfeiting of a United States registered trade-mark, even where the use of such counterfeit mark does not extend beyond the borders of a single state, upon the ground that the user of the deceptive mark in that state is "guilty of contributing to impair the protection afforded by such trade-mark in foreign or interstate commerce."

The constitutionality of a Federal statute so broad in its scope as the one proposed, a statute which will govern the use of a mark on goods manufactured and sold solely within the limits of a single state, when the only authority for Congressional legislation regarding trade-marks in interstate commerce is found in the clause in the Constitution "to regulate commerce with foreign nations, and among the several states, and with the Indian tribes," is questioned. Forbes & Haviland, for the New York Trade-Mark Association, have filed a brief with the committee attacking the constitutionality of such a law. They contend that the power of Congress to regulate trade-marks can be no more extensive than the power to control the disposition of the goods to which the marks are necessarily attached, and that "no statute which Congress may see fit to pass can reach the use of a mark within a single state, even though it be an infringement upon a mark the employment of which in interstate commerce is protected by Congress."

The Trade-Mark Association bill is not open to this constitutional objection, since that, in seeking to protect by a criminal remedy the use of trade-marks in interstate and foreign commerce, it does not attempt to punish the counterfeiting of a trade-mark unless the counterfeit mark is also used in interstate or foreign commerce.

In 1870 Congress passed an act to revise, consolidate and amend the statutes relating to patents and copyrights, and included in its provisions

a new trade-mark law, which was not limited to commerce with foreign nations or among the several states, and in 1876 that law was amended so as to make the violation of certain of its provisions penal offences. The trade-mark law of 1870 was passed by Congress upon the assumption that it derived its authority so, to legislate under Clause 8 of Section 8 of Art. 1 of the Constitution, which provides that Congress shall have power "to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." In 1879 the Supreme Court held that law to be unconstitutional, leaving undecided the question "whether the trade-mark bears such a relation to commerce in general terms as to bring it within Congressional control, when used or applied to classes of commerce which fall within that control," but holding that such control could not be supported as an exercise of the power given to Congress under clause 8, section 8, Art. 1, and that the law in question could not be supported under the commerce clause, because its provisions were not limited to commerce with foreign nations or among the several states. In 1881 Congress passed another trade-mark law for the purpose of regulating and protecting trade-marks used, not in interstate commerce, but in commerce with foreign nations and the Indian tribes only. Congress at that time was of the opinion that the only warrant in the Constitution for such legislation was found in the treaty-making power.

The Bonyng bill, which became a law in 1905, was based upon the opinion now generally entertained, that the commerce clause of the Constitution authorizes Congress to regulate the use of trade-marks on commerce between the states, and the use of marks on such commerce is covered by the provisions of that statute. The Bonyng bill is strictly limited in its operations to trade-marks used in commerce with foreign nations, among the several states and with the Indian tribes. If the contention that the American Bar Association bill is obnoxious to the Constitution because its provisions are not so strictly limited, be correct, then the additional protection to trade marks used in interstate commerce, which the promoters of this legislation seek, is likely to fall far short of what many of them expect and all of them desire. Robert H. Parkinson, Esq., of Chicago, who is said to have drafted the penal section of the Bar Association bill, in a paper, "Concerning Federal Trade-Mark Legislation," states that "No enactment can be adequate for this purpose unless it protects duly registered trade-marks used in interstate and foreign commerce against infringements which impair their

efficiency as guarantees of origin irrespective of whether the infringer be engaged in foreign or interstate commerce, or confines his operations to a single state. Such an infringement, though conducted entirely within the state, would be as fatal to the office which the genuine mark is intended to perform in the interstate commerce to which its owner had applied it, as if the infringer manufactured in New Jersey and sold in New York."

Objections other than constitutional ones are made to the passage of either of these bills. It is pointed out that the patent laws contain no such provisions, and it is urged that under the proposed law "the owner of a registered trade-mark can have the Government assume all the burden of proving his case," and it is contended that it "is a burden that the Government should not assume; which there is no necessity for its assuming until it has been satisfactorily shown that the new law is not sufficient to protect our registered trade marks."

Another bill, H. R. 5349, proposes to amend and extend the provisions of the Bonyng bill, but as serious objections were made to several of its features, its author drafted a new bill, H. R. 15,911, which eliminates most of the features in the first bill to which objection was made. The first section of the bill amends section 1 of the Bonyng bill, which provides that in the application for registration of a trade-mark there shall be given "a description of the mark itself," by inserting after the word "itself," the words "if required by the Commissioner of Patents or desired by the applicant." This amendment is proposed to meet the objection that in ordinary cases a trade-mark needs no description, but shows for itself what it is, and that often an attempt to describe it is likely to prove a limitation upon the right of the applicant, since if the infringer's mark does not come precisely within the written description, it would be held not to infringe it.

The second section of the bill provides that all applications for registration of trade-marks filed before the passage of the Bonyng bill, and on which a fee of \$25 has been paid, shall be deemed to be pending under the provisions of the new law. The purpose of this amendment is to avoid the necessity of paying a fee of \$10 under the provisions of the existing law in certain cases which the Patent Office holds have been abandoned.

The third section of the bill provides "That the Commissioner of Patents shall establish classes of merchandise for the purpose of trade-mark registration and shall determine the particular description of goods comprised in each class. On a single application for registration of a trade-mark, the trade-mark may be registered at the option of the applicant for any or all goods upon which the mark has actually been used, comprised in a single class of merchandise, provided the particular description of goods be stated."

The trade-mark laws of nearly all commercial nations have a provision of this kind, or their laws establish in express terms the classes. In England

there are fifty classes, in Germany forty-two, and in France seventy-four. The practice formerly obtained in the administration of our Patent Office to allow the mark on an entire class of goods to be registered on a single application: but in 1903 the Commissioner ruled in *ex parte Faxon* that under a proper construction of the statute a single trade-mark right would cover only merchandise of substantially the same descriptive properties, since section 7 of the same statute gave a remedy only to those who placed a mark on such goods. Since that time, and particularly since the passage of the Bonyng bill, which increased many-fold the applications for registration, there has been much complaint. Manufacturers state that where, under the former practice, they could protect all their goods by from one to three or four applications, they would now be compelled to make from ten to seventy-five, and of course pay a fee upon each application. While foreign countries are willing to protect American trade-marks, such countries will base their registration on the registration in the country of origin, and so the American manufacturer who produces a certain class of goods and is obliged to split up his application, must do the same in every country where he seeks registration of his mark. Besides the inconvenience to which our manufacturers are subjected by reason of this rule, the pecuniary advantage enjoyed by a citizen of a country which will permit an entire class to be registered on a single application, is not inconsiderable when it is remembered that in some countries it costs from \$50 to \$75 for each registration of a trade-mark. Under the construction now given to the law, the producer of ale and beer cannot include both in the same registration, and the man who cans and sells vegetables, fruit and fish, and desires to protect his goods by a trade-mark, must make three applications and pays three fees. The Commissioner of Patents expresses his cordial approval of the change in the requirements of the statute.

The fourth and last section of the bill gives to a citizen of a foreign country who has a manufacturing establishment within the territory of the United States the same rights and privileges "so far as the registration and protection of trade-marks used on the products of such establishment are concerned," as are enjoyed by our own citizens.

There is still another trade mark bill pending before the committee, H. R. 13,570. This bill proposes to amend the trade-mark law so that any person who has discovered, originated or introduced any new variety of hush, plant, shrub, tree, vine, etc., and applies thereto a name, may have such name registered, and under such registration have for twenty years the exclusive right to propagate for sale such horticultural product under the name so registered. No one has as yet appeared in behalf of this bill.

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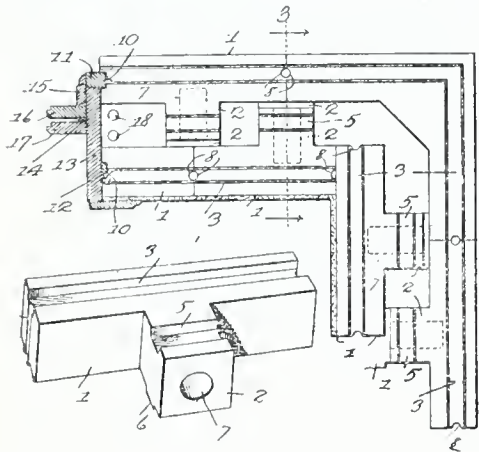
## CLEVER NEW PATENTS.

Building Block.—Rail Joint.—Music Leaf Turner.—Picture Hanger.—Railway Signal Torpedo.

### Building Block.

A new building block, having numerous advantageous features, has been patented by Mr. Andrew Klay, Bluffton, Ohio. The object is to produce a new and useful form of block which is capable of being conveniently handled in the erection of walls, and constructed to enable the binding of adjacent blocks by a minimum amount of mortar which is not exposed at the joints, whereby an attractive form of wall is produced, and the mortar is not subjected to the damaging effects of the weather.

A further object is to construct the block so that a plurality of blocks may be assembled in relatively compact relation in a wall, and at the same time, produce dead-air spaces therein for the exclusion of frost, dampness, and the like. Moreover, the block is constructed to have a relatively broad bearing, so as to obtain the desired binding or holding efficiency when the blocks are united to form a wall.

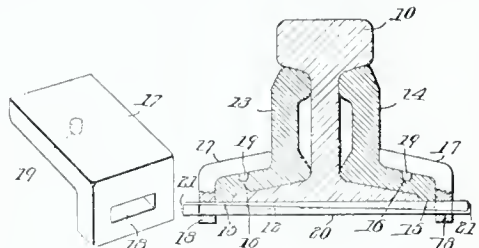


The block, which is shown at 1 in the accompanying cut, has in its upper face, a longitudinal channel 3, while its under face is provided with a longitudinal rib arranged to fit in the channels of the blocks beneath. The ends of the block are provided with upright grooves 8, and an extension 2 is located on the rear side of the block. This extension has a channel 5 in its upper face, and a rib 6 on its lower face. The extension furthermore is provided with an air chamber 7. The blocks are of course placed one upon the other with the extension of each block lying upon the extension of the next block below in the opposite wall-section, and with the ribs of one block fitting in the corresponding channels of the other block, a suitable quantity of mortar being previously placed in the channels 3 and 5. The quantity of mortar employed should be sufficient to fill the space between the bottom of each rib and the bottom of the channel

which receives the rib, so as not to be displaced from the channel when the blocks are assembled, whereby the faces of the blocks come into mutual contact, and the mortar is not exposed at the joints between the blocks.

### Rail Joint.

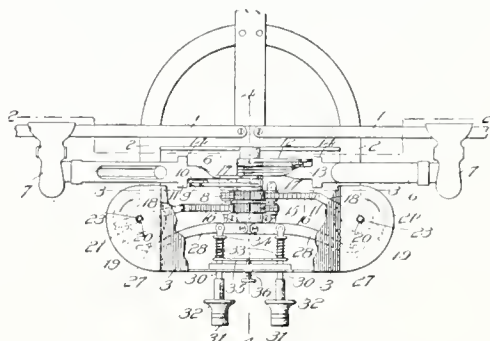
A unique rail joint, which does away with the necessity of bolts or other devices passing through the rails, has been patented by Mr. Elkanah G. Williams, of Harpster, Ohio, who is a well-known inventor. The abutting ends of the rails 10, are provided with fish plates or splice bars 13 and 14 of substantially the ordinary shape, though having no openings. These bars are provided with longitudinal grooves 16. Clamping



ing plates 17 engage over the splice bars, and have lugs 19 that are received in the grooves 16. The outer ends of the clamping bars depend below the plane of the lower face of the rail, and have openings 16, through which are passed oppositely disposed wedges 20, each having a head at one end, and having its other end bent over the head of the opposing wedge. The wedge keys provide a simple means for taking up slack, if any exists, and also for remedying looseness between the parts or tightening the joint in event of wear, or from other causes. The recesses 12 in the rails being wider than the wedge keys, permit the expansion and contraction of the rails. The wedge-keys fit the apertures 18, and the recesses 15, closely at their side edges, so that no play exists in that direction.

### Music Leaf Turner.

Another music leaf turner has been patented by Chester E. Shuler, of Clifton, Kansas. Swinging arms 6 are mounted on a shaft, and have at their outer ends leaf-engaging clips 7. These arms are connected to pinions 8 and 15, operated by reciprocating racks 16. The racks are reciprocated by pitmans 18, connected to spring

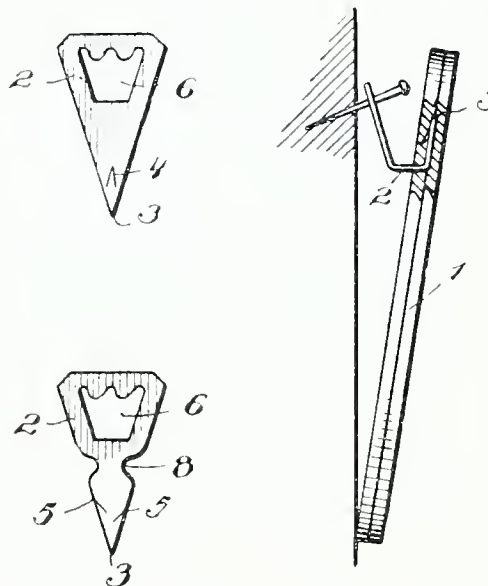


motors 19. Ordinarily, the motors are held against movement by latches 28, and the latches are connected to

operating keys 32. In using the structure, the music is placed upon the rack, and the leaves are secured by the clips 7 to the arms 6. To turn the leaves, therefore, it is only necessary for the operator to depress the keys 32, whereupon the motors are released, and the arms 6 are swung, carrying with each arm the sheet of music. The flat spring 27 is attached at one end to the frame 2, and is adapted to bear against the inner ends of the arms 6, and hold the said arms in position after they have been turned.

### Picture Hanger.

A unique article of manufacture in the form of a picture hanger has been patented by Mr. William W. Pursell, of Pittston, Pa. Two different forms of the invention are here illustrated. The picture hanger, as shown, is stamped out of suitable sheet metal, preferably tin, and is substantially triangular in shape, the point 3 being provided with suitable tangs or teeth, as shown at 4 and 5. The upper portion is cut out at 6, and has a series

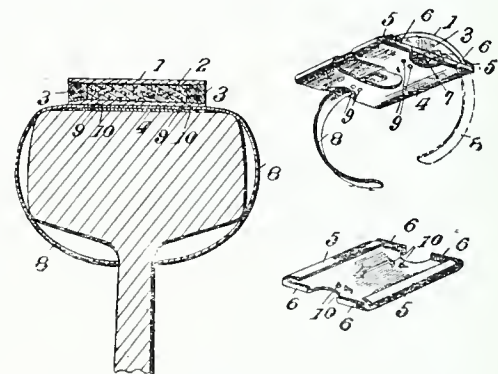


of notches formed therein, and in one of the forms shown the sides are cut away at 8. In using the device, the sharpened point 3 is driven through the backing of the picture, is bent upwardly, the tangs or teeth 4 and 5 being arranged to engage in the front face of the backing, as shown. The enlarged end is then bent upwardly, and is hung from a nail or brad driven into the wall, the bending of the enlarged portion determining the tilt or inclination of the picture. It is

ordinarily a matter of difficulty to perfectly balance the picture when first hanging the same, but with the present device, this difficulty is overcome. For instance, if the picture does not hang level, the same can be hung on the nail or brad by changing it one or more notches on either side of the center, until the proper balance is secured. While this range of adjustment will be generally sufficient, still if the desired balance is not then secured, the form having the cut away portion is preferable, for this permits the bending of the device sidewise or laterally, and consequently the center of gravity can be brought directly under the point of suspension.

### Railway Signal Torpedo.

An improved railway signal torpedo devised by Mr. Frank Dutcher, of Versailles, Pennsylvania, comprises a paper case 1, having a metal attachment 4 that is provided with inturned flanges, clamping the case, and rail



engaging fingers or arms 8. The case has a flat bottom, and a curved top, with plugs 3 in the ends that confine the explosive material. The plugs are preferably composed of a mixture of an inflammable substance, which may be sawdust, and a binding-cement. This will be placed in the ends of the case in a plastic state and is one of the features of the invention. The metal attachment with its inturned flanges serves to hold the paper case rigidly in shape, and also serves to increase the explosive resistance by giving rigidity to the structure.

The torpedo is firmly held to the proper shape, its power of resistance under explosive force is increased, thereby increasing the noise of the explosion, and the material will not fly outwardly from the track, but longitudinally along the same, thereby avoiding any possible danger to bystanders.

## PATENTS, CAVEATS, TRADE-MARKS, COPYRIGHTS, AND DESIGNS. TWENTY-FIVE YEARS PRACTICE.

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## LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

### COLUMBIA WIRE CO. v. KOKOMO STEEL & WIRE CO.

(Circuit Court, D. Indiana. 139 F. R. p. 578.)

#### 1. PATENTS—INFRINGEMENT—IDENTITY OF COMBINATION.

A patent for a combination in a machine of three wheels, each of which is indispensable to the operativeness of the machine, is not infringed by a machine, also having three wheels, but one of which is an idler, and can be dispensed with at pleasure without affecting the working of the machine; such machine being in effect a two-wheel combination.

#### 2. SAME.

The Bates patent, No. 365,723, for a wire barbing machine, construed, and held not infringed.

### RYAN v. METROPOLITAN JOCKEY CLUB et al.

(Circuit Court, E. D. New York. 139 F. R. p. 579.)

#### PATENTS—INFRINGEMENT—STARTER'S GATE FOR RACE TRACKS.

The Ryan patent, No. 553,740 for a starter's gate for race tracks, claim 1, construed in the light of amendments made when before the Patent Office, and held not infringed.

### NATIONAL ENAMELING & STAMPING CO. et al. v. NEW ENGLAND ENAMEL- ING CO.

(Circuit Court, S. D. New York. 139 F. R. p. 643.)

#### 1. PATENTS—PROCESS—VALIDITY.

If the inventor of a process in the claims of his patent therefor has so defined his ingredients that there can be no mistake as to what he means, and has indicated a process which will transform those ingredients into the product claimed, it is immaterial that he was wholly ignorant of all of the chemical changes that take place in the course of such process, and such fact will not defeat the patent, but it may properly be taken into consideration in construing the language and terms used in the specification in describing the process.

#### 2. SAME—INFRINGEMENT—ENAMELING METAL WARE.

The Claus patent, No. 527,391, for enameling metal ware, covering both the process and product, is not a broad and fundamental one, but discloses novelty and patentable invention when considered as an entirety and limited to a process (and product) wherein mottles are formed in a single coat of enamel as the result of a partial oxidation of the metal surface, produced by the action of metallic salts applied to an enamel while still moist, either on the article or in the dip, the ingredients of which enamel show a great preponderance of alkaline substances, but which nevertheless does not neutralize the metallic salts, but facilitates their presentation to the surface of the metal while still efficient as oxidizing agents. Claim 1 held void as too broad in view of the prior art, and claims 2 and 3 because they make no reference to the mottles nor to the intense alkalinity of the "mix" from which the enamel is made, which is the essential feature of the invention. Claims 4 to 8, covering the product, and 9 to 12, covering the process, held valid and infringed.

#### 3. SAME.

Infringement of a patent for the enameling of metal ware by applying a single coat of mottled enamel as described, in not avoided by the applying of a second coat, where, in applying the first, the process of the patent is used, and the product is an infringing article, and the second is merely a transparent coat of different material, and differently applied.

### WALTER BAKER & CO., Limited, v. PURITAN PURE FOOD CO.

(Circuit Court, S. D. New York. 139 F. R. p. 680.)

#### 1. TRADE-MARKS—INFRINGEMENT—IMITA- TION OF LABELS.

Equity will afford relief against the infringement of a trade-mark consisting in part of a picture or figure, although the alleged infringing picture is not a close imitation, but is merely of the same generic character, where the resemblance is such as is calculated to mislead ordinary purchasers

into buying the product of defendant for that of complainant.

#### 2. SAME—LABELS FOR CHOCOLATE AND COCOA—SIMULATION OF PICTURE.

Complainant and its predecessors for 30 years or more have used as a trade-mark for their preparations of chocolate and cocoa, both in advertisements and in their labels, a full length picture of a woman or girl in the dress of a waitress, copied from a painting, in connection with their name and location as manufacturers. During such time complainant's products have become widely known, and are called for by a considerable class of customers, notably children and others unable to read, as the kind with the woman or girl on the label. Held, that the later adoption and use by defendants of labels on the same kind of products, the principal feature of which is the full-length picture of a woman or girl, having a general similarity in appearance, although differing in dress and position from that of complainant, and in connection with its own name as manufacturer, constituted an infringement, which entitled complainant to an injunction; the similarity being such as is calculated, and as indicates an intention, to deceive purchasers.

### MARLIN FIREARMS CO. v. DINNAN.

(Circuit Court, D. Connecticut. 139 F. R. p. 658.)

#### PATENTS—INFRINGEMENT—MAGAZINE GUNS.

The Hepburn patent, No. 584,177, for a magazine gun was not anticipated, and discloses invention. Also held infringed.

### BANKS LAW PUB. CO. v. LAWYERS' CO-OPERATIVE PUB. CO.

(Circuit Court, S. D. New York. 139 F. R. p. 701.)

#### 1. COPYRIGHTS—INFRINGEMENT—PLEADING —SUPPLEMENTAL BILL.

In a suit for infringement of copyrights of a number of books the complainant may properly be allowed by a supplemental bill to set up further infringements of other books of the same series, occurring subsequent to the filing of the original bill, the parties being the same, and the subject-matter of the same general character, which may appropriately be determined in the same suit.

#### 2. SAME.

Where a bill for infringement of copyright sufficiently alleges title in complainant to the cause of action by assignment, a supplemental bill otherwise good is not invalid because it alleges a further assignment in the nature of a confirmation or ratification of complainant's title.

### LEA v. NEW HOME SEWING MACH. CO.

(Circuit Court, E. D. New York. 139 F. R. p. 732.)

#### TRADE-MARKS—LICENSE TO USE—VALIDITY.

A contract purporting to license the use of a trade mark or name for a sewing machine is invalid, and will not support an action to recover royalties reserved thereby, where the only thing granted is the right to sell machines made by defendant, with which plaintiff has, and has had, no connection, under a name previously used by him in connection with different machines.

### BATES MACH. CO. v. WM. A. FORCE & CO.

(Circuit Court, S. D. New York. 139 F. R. p. 746.)

#### ABATEMENT—ANOTHER ACTION PENDING— SEPARATE SUITS ON SAME PATENT.

The pendency of a suit for infringement of certain claims of a patent specifically named by number in the bill is not a bar to a second suit in the same court by the same complainant against the same defendant, for the infringement of different claims of the same patent, also specified in the bill, where the two sets of claims cover distinct and different devices, although in the same machine. In such case the causes of action in the two suits are not the same.

### SANITARY FIREPROOFING & CON- TRACTING CO. et al. v. SPRICKERHOFF et al.

(Circuit Court of Appeals, Second Circuit. 139 F. R. p. 801.)

#### 1. PATENTS—SCOPE OF CLAIMS—INFRINGEMENT.

An inventor is not called upon to describe every use to which his invention may be put, and, if he discloses it fully and clearly in one environment, a person who uses it in another and different environment, the change requiring no inventive skill, cannot escape infringement.

#### 2. SAME—INFRINGEMENT—FIREPROOF WALLS.

The Geraerds patent, No. 555,693, for a fireproof wall consisting of a series of thin plates or blocks placed edge to edge, and provided with grooves in their sides and ends, and with registering mortises in the grooved edges thereof, and metallic tenons for connecting the plates or blocks at the sides and ends, discloses invention, and is valid, and is infringed by the use in building dumb-waiter shafts, of plates or blocks, each extending across one side of the shaft, having grooves, and mortises and tenons on the horizontal edges, and on the vertical joints at the corners held together by metallic tenons bent at right angles and laid in the horizontal grooves. Such method being an obvious adaptation of the principle of the patent to corner construction.

### WESTINGHOUSE ELECTRIC & MFG. CO. v. MONTGOMERY LIGHT & POWER CO.

(Circuit Court of Appeals, Second Circuit. 139 F. R. p. 868.)

#### PATENTS—INFRINGEMENT—ELECTRICAL CONVERTERS.

Infringement of the Stanley patent, No. 469,809, for a system of electrical distribution, held not sufficiently established by the ex parte proofs on the hearing of a motion for a preliminary injunction to warrant the granting of such injunction.

### AUTOMATIC SWITCH CO. OF BALTI- MORE CITY v. CUTTER-HAMMER MFG. CO.

(Circuit Court, S. D. New York. 139 F. R. p. 870.)

#### PATENTS—INVENTION AND INFRINGEMENT— REGULATOR FOR ELECTRIC MOTORS.

The Whittingham patent, No. 499,769, for a regulator for electric motors having an electric magnet of the solenoid form, discloses patentable invention. While the parts separately were old in an allied branch of the prior art, the combination of the patent was novel, and accomplished a new and useful result, and marked a distinct advance in the machines to which it was applied over those of the prior art. Claims 4 and 5 held infringed. Claims 6, 7, and 8, in so far as they make an iron cap on the solenoid, the function of which is described, an element of the combination claimed, must be limited to the specific construction shown, and, as so construed, held not infringed.

### B. F. AVERY & SONS v. J. I. CASE PLOW WORKS.

(Circuit Court, E. D. WISCONSIN. 139 F. R. p. 878.)

#### 1. PATENTS—CONSTRUCTION OF CLAIMS— EFFECT OF FORMULA "SUBSTANTIALLY AS DESCRIBED."

Where a patent contains specific claims in which certain features described in the specification are expressly claimed, and also broad claims from which such features are omitted, they cannot be read into the broad claims because of the closing formula "substantially as described," for the purpose of narrowing such claims to avoid anticipation.

#### 2. SAME—INFRINGEMENT.

Where a patentee in a claim for a combination specifies any element as entering into the combination, he makes such element material to the combination, and it cannot be held immaterial by the court for the purpose of finding infringement.

### SIEGERT et al. v. GANDOLFI et al.

(Circuit Court, S. D. New York. 139 F. R. p. 917.)

#### 1. TRADE-MARKS—RIGHT TO NAME—"ANGOSTURA BITTERS."

Complainants, manufacturers of bitters at Port of Spain, Trinidad, under the firm name of "Dr. J. G. B. Siegert and Sons," held on the evidence not entitled to the exclusive use of the name "Angostura" as a trade-mark or trade-name in connection with their product, but the firm of C. W. Abbott & Co., of Baltimore, manufacturers of bitters sold by defendant, held entitled to use such name in the way it does use it, on evidence showing that such firm and its predecessors have continuously used it in connection with their product for more than 50 years.

#### 2. UNFAIR COMPETITION—RIGHT TO PROTEC- TION IN EQUITY—FRAUDULENT REP- RESENTATIONS.

A manufacturer of bitters, which in its advertisements to the public sets out what purports to be certificates of chemists and

medical experts stating that they have analyzed such bitters, that they contain ingredients which are harmful or intoxicating, and recommending them for use by invalids, both adults and children, when in fact such bitters contain more than 40 per cent. of alcohol, is guilty of fraudulent misrepresentation, and is not entitled to the aid of a court of equity to protect its product against alleged unfair competition.

### STUART v. AUGER & SIMON SILK DYE- ING CO.

(Circuit Court, D. New Jersey. 139 F. R. p. 935.)

#### PATENTS—ANTICIPATION—PROCESS AND MA- CHINE FOR LUSTERING SILK.

The Stuart patents, No. 705,715, for a process of intensifying the luster of silk fiber, and No. 705,716, for a machine for carrying out such process, are both void for anticipation; the former by the process of the Hendrie British patent of 1845, and the latter by a French machine from which that of the patent was copied.

### DODGE COAL STORAGE CO. v. NEW YORK CENT. & H. R. R. CO.

(Circuit Court, N. D. New York. 139 F. R. p. 976.)

#### PATENTS—PATENTABLE INVENTION—AGGRE- GATION OF OLD ELEMENTS IN STORAGE APPARATUS.

The Piez & Beaumont patents, No. 668,960 and No. 688,111, granted on a division of the same application, both being for improvements in storage apparatus consisting of mechanism for piling coal or analogous material and for removing material from a pile, are void for lack of novelty and patentable invention in view of the prior art, and because each is for a mere aggregation of old elements, each of which performs separately its old function.

### KILLEEN v. BUFFALO FURNACE CO. et al.

(Circuit Court, W. D. New York. 140 F. R. p. 33.)

#### 1. PATENTS—INFRINGEMENT—CASTING AP- PARATUS.

The Killeen patent, No. 608,143, for casting apparatus for blast furnaces, consisting of a metal skimmer trough having a skimming barrier and a dam below, and as an essential feature a drain opening in the side of the trough above the dam, was not anticipated, and, while of narrow scope, in view of the undoubted utility and the immediate and wide adoption of the apparatus by those skilled in the art, must be conceded novelty and patentable invention. Also held infringed by the device of the Bachman patent, No. 636,885.

#### 2. SAME—PRIORITY OF INVENTION.

The general rule is that he who first reduces an invention to practice is ordinarily held to be the inventor as against another who claims to have previously conceived the idea which led to the invention, but made no practical application of it.

### BROWN BAG-FILLING MACH. CO. v. DROHEN.

(Circuit Court, W. D. New York. 140 F. R. p. 97.)

#### 1. PATENTS—INVENTION AND INFRINGEMENT —BAG-FILLING MACHINE.

The Cummings patent No. 578,171, for a machine for filling paper bags with seed or other fine material, covers a combination of many elements, some of which were old and others new, but which, acting in co-operation, constitute the first practically operative and successful machine for accomplishing the desired result, and in such sense is for a primary invention, and entitles the patentee to invoke the doctrine of equivalents with respect to a substitution of parts which perform the same functions in the combination. The patent construed, and held infringed.

#### 2. SAME—IMPROVEMENT PATENT.

The Brown patent, No. 573,133, for an improved folding mechanism for use with the bag-filling machine of the Cummings patent, No. 573,171, held valid and infringed.

### COMPTOGRAPH CO. v. MECHANICAL ACCOUNTANT CO.

(Circuit Court, D. Rhode Island. 140 F. R. p. 136.)

#### PATENTS—INFRINGEMENT—COMPUTING MA- CHINE.

The Felt patent, No. 465,255, for a computing machine, claims 7 and 8, which relate to subtraction cut-offs, if valid, are limited to the precise construction shown. As so construed, held not infringed.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Daniel A. Lawrence, Weldon, N. C. Telegraph Key Attachment.—This patent covers a unique device for preventing cramp and partial paralysis of the muscles, resulting from the strain of the unnatural position of the arm, hand and wrist in operating an ordinary telegraph key. It comprises a cap adapted to be fitted over the button of a telegraph key, and having means for engaging the same and provided with a socket, an upright support provided at its lower end with a head fitting in the socket of the cap, and a cross piece adapted to receive the hand and adjustably mounted on the support. The hand-receiving cross piece is adapted to be readily raised and lowered to arrange it at the desired elevation, and it is capable of moving backward and forward and transversely of the key to accommodate itself to the position of the hand of the operator.

Charles A. Paul, Orlando, Okla. Latch.—This latch, which is as highly ingenious as it is simple, is adapted to be readily applied to screen and other doors, and it enables the same to be readily opened and closed by pressure on the interior and exterior, without operating it by hand in a manner similar to an ordinary latch. The device also forms a support for the door, when the latter is closed, and as the door is slightly elevated by the latch, it will be effectually prevented from sagging, and its weight will operate to resist any tendency to open it. The latch consists of a fixed projection carried by the door, and a wheel mounted on the door casing and arranged to be engaged by the fixed projection. The fixed projection, which, in the closing movement of the door, engages the wheel above the center, is carried upward by the wheel, and when the door is closed it lies beyond the vertical center of the wheel, at a point between the plane of the top of the same and the horizontal diameter thereof, whereby the door is securely latched.

Thomas Bond, Sr., Dallas, Texas, inventor; Fred. J. Pagel, same place, assignee. Rein Holder.—The rein holder of this patent is applied to the dashboard of a buggy, or other vehicle, for holding the reins when the driver leaves the vehicle. It consists of a lower clamping plate, provided with a central recess and having longitudinal corrugations at opposite sides of the recess, and an upper resilient clamping plate, provided with a depending lug fitting in the recess of the lower clamping plate. The lug separates the clamping plates and interlocks the same, so that they may be secured together by a single fastening device. The reins may be quickly placed between the clamping plates without crossing them, and as they are held at opposite sides of the center of the dashboard, they will, when removed from the clamping device, be in position for driving.

Gideon P. Kidd, Roann, Ind. Automatic Gravity Gate.—This gate, which ranks among the best ever devised, is operated by the wheels of a vehicle, and it opens and closes by gravity. It is cushioned in its opening and closing movements, and it is locked both in its open and closed positions. The gate is slidably suspended from an oscillatory track, and means are provided for positively holding the gate against lateral movement to prevent animals from pushing through it. The track is oscillated by crank shafts, located at opposite sides of the gate at suitable distance therefrom, to enable them to be operated by the

wheels of a vehicle without liability of the draft animal, or the vehicle, being struck by the gate. The crank shafts are connected by bars with a substantially Y-shaped lever, which has one arm connected with the oscillatory track, whereby when either crank shaft is operated, the track will be shifted for opening or closing the gate.

Ralph Gaines, Metcalf, Ill. Baby Jumper.—It is the object of the present invention to provide a baby jumper adapted to yieldably support the body of a child and afford free use of its limbs. It is capable of adjustment to arrange the feet of the child in proper position with relation to the floor, and also to vary the tension of the spring to suit the weight of the child. The device, which may be applied to a window or door casing, or other fixed support, comprises a bracket having an outwardly extending arm, a lever fulcrumed on the bracket below the arm, and a spring supported by the arm and connected with the lever. The lever is provided at its free end with a cross bar, to which is secured a sling. The sling consists of a band and a pair of broad straps, which form a seat for the child. The band has separable ends to enable a child to be readily placed in the sling.

Nora Velnetta Steele, Missouri Valley, Iowa. Carpet Cleaner.—This machine is provided with means for rapidly beating a carpet, and for sweeping the dust and dirt therefrom, whereby a carpet may be quickly cleaned without injury to it. The machine comprises a portable platform, standards arranged at the end of the platform and provided with legs, and a horizontal shaft journaled on the standard and carrying carpet cleaning devices, consisting of rotary beaters and adjustable sweeping devices. The rotary beaters are provided with stems, adjustably secured to the horizontal shaft and having laterally extending heads at their outer ends. Flexible striking devices are connected at their inner ends with the heads, and are provided at their outer ends with balls. The sweeping devices are in the form of brushes, which are provided with stems adjustably secured to the horizontal shaft. The machine is provided at opposite sides of the platform with adjustable carpet cleaning supports, and the carpet, which is arranged on the supports, extends beneath the shaft, so that a portion of it is exposed to the action of the rotary cleaning devices. The carpet supports are adapted to be raised or lowered to arrange the carpet in proper position to be effectively operated on by the flexible beaters and the brushes.

Edson Gery, deceased, late of Whatcom, Wash. Earth and Rock Auger.—This invention relates to an earth and rock auger, designed especially for prospecting mining grounds, and provided with means for automatically collecting the borings and for enabling the same to be readily raised to the surface of the ground without removing the auger. The borings are collected within a receptacle, and a continuous alarm is automatically sounded, when the receptacle containing the borings is filled. The earth and rock auger embodies a drill tube, a drill head secured to the tube and having a shoulder spaced from the lower end of the same to form a ball race, and a series of anti-friction balls are arranged in the ball race. These anti-friction devices project horizontally beyond the drill tube and the drill head for engaging the well casing to reduce the friction to a minimum. A corrugated section is detachably connected with the upper end of the drill tube, and is movable through a rotary element of the operating mechanism. The rotary element of the operating mechanism consists of a large gear wheel having an opening conforming to

the configuration of the corrugated section, which is rotated by the operating mechanism. There eptacle is arranged within the drill tube, and it is provided at the bottom with an inwardly opening automatically closing valve which consists of a plurality of tapering sections. The receptacle for the borings is provided with upper and lower members: the valve is carried by the lower member, and the upper member is provided with an electric bell, having a depending button arranged to be engaged by the borings, when the latter accumulates sufficiently to fill the receptacle. By this means a continuous alarm is sounded, when the receptacle is full. The receptacle is raised and removed by means of a rope or cable extending upward through the drill tube.

Martin E. Thomas, Batavia, Iowa, inventor; H. P. Carter, Memphis, Tenn., assignee. Vehicle Axles.—This patent covers a simple and ingenious device for enabling the spindles of an axle, when worn, to be readily removed and renewed without the assistance of a skilled mechanic, and without removing the axle from the vehicle. The axle is provided with a collar having a dove tailed recess, and the detachable spindle is provided with a dove-tailed section or member, which fits within the recess and completes the collar of the axle. When the parts are assembled, the collar is received within the wheel, which retains the parts in their interlocked relation. It is impossible for the spindle to become disconnected from the axle before the wheel is removed, and the axle nut is the only fastening means employed.

William R. Bradford, Florence, Ky. Buggy Boot Spring.—This device is in the form of a simple attachment, which is adapted to be readily applied to a buggy, and which will obviate the necessity of hinging the buggy boot directly to the seat frame. The buggy boot spring, which is adapted to hold the buggy boot firmly in its closed position, comprises a spring coil, a short arm extending from one end of the coil and provided with an eye to receive a fastening device for securing the short arm to the seat frame, a long arm extending from the other end of the coil and connected with the rear portion of the boot by means of a rod or wire, and a fixed support having an approximately semi-tubular portion, which receives the spring coil. The fixed support has a flat head which is secured to the seat frame.

Floyd W. DeTray, inventor, Aurora, Ill.; George E. Fink, Chicago, Ills., Knoxall Mfg Co., Aurora, Ills., assignees. Vapor Lighting and Heating Device.—The DeTray apparatus is designed to utilize gasoline as a fuel for lighting and heating systems in a manner to comply with the underwriters requirements, particularly as to the utilization of a sub-flame for the generation of the vapor, the provision of an automatic safety trap preventing the escape of gasoline into the service pipes in case the sub-flame is accidentally extinguished, the storage of only a small quantity of gasoline in liquid form on the premises, and the automatic reduction of pressure in the system in the event of fire. Air is compressed in a suitable reservoir by an air compressor, and is supplied alternately to a pair of gasoline tanks, one of which may be filled while the other is being utilized. The gasoline under pressure is supplied from either tank to the generating or vaporizing coil, suitable check valves preventing back pressure in the tanks. The vaporizer communicates with the casing of an automatic safety-trap, within which is located a float-operated valve and from which the service-pipes are led. The vaporizer coil is heated by a sub-flame burner controlled by a burner valve.

George K. Caviness, Seymour, Iowa, Charles J. Yarrington, Princeton Mo. Heating Apparatus for Incubators.—The object of this invention is to provide an incubator with heating apparatus which will insure an even temperature uniformly throughout the extent of the incubating chamber, the control of the apparatus to suit varying conditions being effected automatically and without necessity for the attendance of an operator. A further object is to insure the proper diffusion and circulation of the air under the egg tray, and to so organize the elements of the heating device that the later may be easily installed for use, or detached from the incubator for cleaning and repair. Supported beyond one end of the incubator casing is a lamp, above which is a flue which conveys the products of combustion therefrom. Surrounding this flue is a drum, and within the casing at the top thereof is a heating tank. Extended from the flue and into this heating tank are heating tubes, through which the products of combustion pass to the tank. A diffusion pipe establishes communication between the bottom of the casing and the interior of the drum to insure proper circulation of the air under the egg tray, and a thermostatic device is provided for regulating the flow of the products of combustion through the heating tubes.

Frederick L. McMullen, Moundsville, West Va. Tailor's Block.—This patent shows a revoluble tailor's block which is supported at one end only, and is tapered uniformly toward its unsupported end so as to fit tightly within the ends of trouser legs of different sizes. This enables the tailor, after placing the gummed tissue on the leg and turning back the hem, to iron down the latter by the application of a flat iron with one hand, the other hand being used, if necessary, for the purpose of holding the hem in place, as the block is gradually revolved by the manipulation of the iron.

Benjamin J. Rosewater, Eureka, Springs, Ark. Manifolding Device.—The device is designed to facilitate the manifolding of entries in record or other books in order to obtain one or more copies of checks, receipts, money orders, and the like. A thin metal base-plate adapted to be slipped just within the cover of a record book, is provided with a vertically adjustable platen in the form of a thin plate capable of being introduced between the leaves of the book. This platen is connected to the base plate by a flexible connection, and is provided with a clamp which retains the carbon sheet or sheets in place. One side of the platen is extended to form a wrist support for the person making entries in the book.

Edward H. Barton, Sprague, Wash. inventor; W. T. Favorite, Clarence V. Schermerhorn, Sturgis, Mich., assignees of three-fourths interest. Corn Popper.—The idea of this inventor is to provide a simple device which will not only effectively pop the corn, but may be made to act as a separator in order to eliminate the unpopped kernels. An oblong receptacle of sheet metal is employed, to one end of which is secured a handle. An imperforate cover is slidable on the receptacle, and has an engagement with the handle. Beneath this slidable cover is a swinging screen or grate extending but partially the length of the receptacle. In popping the corn, the imperforate cover is located over the receptacle, and to separate the unpopped kernels, it is only necessary to draw back the imperforate cover and turn the receptacle upside down, whereupon the kernels that have not popped, will drop through the screen, while the popped corn will remain within the receptacle.





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**FOR SALE**—Patent No. 804,652, dated Nov. 14, 1905. The only patent tweezer device for holding the lever to top plate while setting up watches. Indispensable for 21 jeweled, quick and safe for all full plate watches. Address, E. C. Ellsworth, Cambridge, Vt. jy

**FOR SALE**—Patent No. 808,777, dated January 2, 1906. The Peterman revolving telegraph key. A single key that will work a number of different wires, and the same time the operator can hear his call and business going over any of the wires connected to same. This key has been thoroughly tested, and is now in use in my office open for inspection. Address, Addison Eugene Peterman, Repton, Conecuh Co., Alabama. jy

**FOR SALE**—U. S. Patent No. 814,630; and Canadian patent No. 98,297. A mail bag catcher that will save lives and loss of mail sacks. Will sell outright. Address, D. F. Stokes, R. D. No. 6 Kenton, Ohio. jy

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## Iron vs. Steel.

During the last decade of the century just closed, the advance in the manufacture of steel and the substitution of this metal for purposes previously held by wrought iron, caused capable observers to think that the latter would soon play but an unimportant part in metallurgy. Many of the most important firms in the industry—including Carnegie's—withdraw entirely from puddling work. Wherever possible, steel was made to take the place of iron, and it was declared that the substitution of a homogeneous, well-made metal like steel, for a non-homogeneous metal like wrought iron, which is apt to be full of flaws, was clearly a step in the right direction. But the first years of the twentieth century have marked a distinct trend back to the use of wrought iron. Extended experience with steel has shown that for certain constructions, it is not proving as satisfactory as was expected. Some years ago, the iron nail was practically driven out of the market by the cut-steel nail; many consumers have found cause for complaint in the fact that the latter bends readily, and it has also been demonstrated that structures made with steel nails would not hold because the nails rusted off under the heads very rapidly. For scaffolding and similar purposes, the steel nail has less holding power than the iron one, and a growing demand for the old style of nail has arisen. There is also a general outcry among tinmiths and roofers that the galvanized and tin sheets of the present do not last anything like as long as those made twenty-five years ago. For wrought iron pipe, notwithstanding the higher cost of production, the demand has been sufficient to employ several important works exclusively for the manufacture of this product. For boiler tubes, steel is not regarded as satisfactory, and most locomotive tubes are now made from charcoal iron. It is a striking illustration of this new tendency that one of the largest steel manufacturers in the

country will not permit a steel tube to be used in one of the boilers of his factory, or a steel sheet on the roofs of his buildings.

When subjected to the bending stress, also, iron and steel do not behave alike. It is asserted by an authority that a well-made car axle of iron, the metal of which will show in tensile strength 50,000 pounds per square inch, will endure the same fiber stress as steel of 80,000 or 85,000 pounds tensile strength. But the most prominent instance in which steel has been weighed in the balance and found wanting, is in the manufacture of fence wire.

The industry of making steel wire fencing has developed into enormous proportions. Hundreds of patents have been issued for devices for connecting the wires, and any traveller through the West, cannot fail to note the countless miles of fencing used to enclose ranches, etc. As wood becomes scarcer, wire fence will grow in importance, and its durability becomes a serious question. There will be found in another column of this edition a description of the methods of making wire fencing, with suggestions as to the possible solution of the problem. The outlook seems to be that, if wrought iron can be made in sufficiently large masses, so that flaws and defective welds will be eliminated, it will again become a successful rival of steel.

## Fighting Yellow Fever.

The discovery of the causal relation of a certain species of mosquito to yellow fever has been justly called the most valuable contribution to medicine and public hygiene ever made in this hemisphere. When it is remembered that within the last century, the United States had half a million sufferers from this disease, and more than a hundred thousand deaths, and that the loss to the country in the epidemic of 1878 was estimated at a hundred million dollars: and that now the scourge has been eradicated from Havana and the Gulf States, the practical value of this brilliant discovery is proven. Since the control of this disease is one of the most important of our problems at Panama, the recently published official report of the methods adopted in vanquishing it last year in New Orleans acquires a peculiar interest. For it should be noted that while the first victory over yellow fever was attained in Havana, the greatest was in New Orleans. The Cuban city had a population, 95 per cent of whom were immune, and was built upon high and dry ground: while the population of our Southern metropolis was at least 75 per cent non-immune, and the city itself is a perfectly natural habitat for the mosquito. Further, the fight began in Havana in the early spring, against two or three cases. It began in New Orleans under the blazing sun of July, and was waged against hundreds of cases, with the result that the epidemic was conquered without aid of frost.

The conclusions reached from the official report are that, in spite of the popular belief to the contrary, yellow fever is easy to control. In fact, it is declared that if only the people would be frank with the health officers, there would be no more reason in quarantining it than there would be in quarantining typhoid. It is stated as an absolute law, that a case of yellow fever known in the first two or three days of its existence, and to which

proper measures can be applied, presents absolutely no menace to the community, or even to residents of the same house. The measures in question are extremely simple: the patient is carefully screened and the house fumigated, the latter operation being repeated before the expiration of twelve days, to be sure that no infected mosquitoes have escaped. It is emphasized that these measures were only palliative: the true way to fight yellow fever is to destroy the breeding places of the insects by oiling or draining all pools of water, and controlling the sewerage. Nevertheless, although only temporary, the work was most successful: for it is recorded that this particular species of mosquito (the *Stegomyia*) does not like to travel even a few yards away from its habitat, and that it cannot abide the sun, two minutes' exposure to the hot rays of the latter being sufficient to kill it. One of the steps taken—that of salting 750 miles of street gutters—had for an incidental result the cutting down of the malaria rate to practically nothing. Altogether, the triumphant issue of the work in New Orleans puts it beyond question that yellow fever, in future, will be treated solely as a mosquito proposition, and not as an inscrutable order of Providence.

## Making Successful Inventions.

In the case of such things as tools, novelties and the like, which have no moving parts,—those which are to be described as articles of general use rather than producing mechanisms,—there are two principal questions to be answered. The first is, at what cost can they be produced and sold? The second is, will they take with the public? The answers to these questions will form the "raison d'être" of the invention. Many hundreds, perhaps thousands, of inventions are annually patented which are failures from the start for reasons indicated by one of these two questions.

Both of these questions ought to be decided positively before any money is put into the invention, at least any more than is necessary to protect it temporarily, as by filing the patent application. Several of the articles should be made up in finished form and shown to different classes of users with a request for their opinion. For instance, a new style of wrench should be taken, or sent, to some large hardware dealers (not manufacturers) with a request for their opinion as to whether they could sell the article and at what price, in wholesale lots. A few samples also might be distributed among practical machinists with requests for their opinions after a week's use.

Then, if the reports be favorable, the price should be figured out at which they could be produced on a regular manufacturing scale, all labor and material, expenses of management, etc., included. In this calculation it is best to take it on the basis of contracting the work out, and application for estimates for furnishing the article should be made to firms equipped for manufacturing this kind on contract.

If the estimate of cost thus obtained exceeds that which it is ascertained can be got from the wholesale jobbers, then either the invention must be abandoned, or it must be so altered in construction that it can be made at a sufficiently lower price to enable it to be sold at a profit. In the majority of cases, I find that this simple matter of addition and subtraction, with a small ingredient of exertion, has not been gone through with at all, and the inventor merely goes upon theory, rather than upon facts which he could easily ascertain in advance—*Cassier's Magazine*.

## A Rival to Steel.

One of the epoch-making inventions of the nineteenth century was the process of manufacturing steel. Of all the steps of progress in the art of metal working, none had a more far-reaching effect than the Bessemer method of treating cast iron. In a popular vote recently taken by a scientific journal, as to what invention introduced in the past fifty years had conferred the greatest benefit upon mankind, Bessemer steel was given the place of honor. In view of the admitted influence of steel upon modern civilization, it will surprise most people to learn that there is a tendency among metallurgists to return to the use of wrought iron. The working qualities of soft steel are unquestionably superior, but the test of use shows that for many purposes, it is not so durable as iron. For pipes, nails, boiler tubes, and especially for wire fencing, steel is becoming discredited. The widespread importance of the subject warrants a brief review of the processes of making iron and steel, as well as the manufacture of fence wire, in order to render intelligible a statement of the cause of the deterioration of steel.

Iron is found in nature combined with oxygen in the form of an oxide, and in smelting the ore, this oxygen is removed. To do this, the ore is mixed with coke and limestone, and heated in large furnaces in which a blast of hot air is forced upon it. Coke is almost pure carbon, and when it burns in the furnace, it not only combines with all the oxygen of the air, but also takes away the oxygen which was combined with the iron in the ore, passing out of the stack in the form of gas. The metallic iron is thus set free in a molten condition, and is allowed to pass out into a series of sand molds known as the pig bed. Here, as the pig iron cools, some of the carbon crystallizes, but much remains in the iron, together with manganese, sulphur, phosphorus, and silicon, which have existed as impurities in the ore, coke and limestone. This is the crude form of the metal, the raw material for the manufacture of all finished grades of iron and steel.

Steel making, in brief, consists in eliminating the carbon and other extraneous elements. Oxygen—that gives life to all creatures yet burns up and destroys all things: oxygen, which may be had without money in infinite quantities—became the creator of cheap steel. In the Bessemer process, the molten cast iron is poured into a large vessel called the converter, and subjected to a blast of hot air, that burns out the carbon and silicon. There is nothing in the world, unless it is a volcano in eruption, that resembles a converter. It is the fiercest and most strenuous of the inventions of man. One look at a converter, it is related, transformed Andrew Carnegie from a company promotor into a steel man for life.

A converter is a huge iron pot, swung on an axle, so that it can be tilted up and down. It weighs as much as a battalion of five hundred men, yet can be handled by a boy. About thirty thousand pounds of molten iron are poured into it, and a strong blast of



air turned on through holes in the bottom. The converter roars like a tamed Mount Pelee, and the impurities are hurled, in the form of red-yellow sparks, a hundred feet into the air. A certain quantity of manganese is added to act as a "flux," or in other words, to cause gases to escape and to render the mass even and smooth. The great pot is then tilted, and the lake of white fire is poured into molds, to assume the form of ingots.

In the "open-hearth" process, the iron is melted in large basins and the carbon is burned out by the play of hot air over its surface, while at the same time the phosphorus and silicon are absorbed by the basic lining of the furnace, which is made of a form of limestone known as dolomite. Manganese is added as in the Bessemer method, and the resulting steel is of a fine and uniform quality, used for tools, armor plate for vessels, etc. But all our steel rails, the great beams and girders that make our skyscrapers and bridges, the wire, nails, tubes, freight-cars, and innumerable things great and small, are made of Bessemer steel.

In making fence wire, the steel ingots already described are re-heated to a red heat, rolled down, and cut into lengths of a certain size, known as billets. The horizontal wires of a woven fence are made from hard steel, containing a high percentage of carbon, in order to attain tensile strength. The tie wires, which should bend easily, are made of softer steel. The billets are rolled hot into wire rod, which is pickled into sulphuric acid, then soaked in hot limewater to remove the acid, baked for half a day, and drawn cold through dies of hard steel to the required gauge. The wire is now ready for galvanizing. It is first softened or annealed, and afterwards run into a vessel containing melted zinc. As it quits this bath, asbestos wipers remove the zinc and leave a smooth coating. It then goes to the weaving room, where the finished product is turned out. In some cases, as mesh for poultry, the galvanizing is done after the weaving.

From the above brief description, the user of steel wire can understand the problems of corrosion and deterioration of iron and steel. Elaborate experiments have been made by metallurgical experts with wire, from which it has been found that the more manganese it contains, the shorter will be its life. Whenever the wire is wet, electrolysis sets in, which causes oxidation or rusting. To such an extent is this true, that many farmers have under their observation wire fences that were put up thirty years ago, which are still in excellent condition; while others that are only a few years old are already showing signs of decay. The old wires, it was found, contained very little manganese; while the new ones, made by the modern processes of preparing steel, had a high percentage of this element.

In the minds of most authorities, a return to the older method of making wrought iron would be the best solution of the problem of making durable wire. In puddling iron, the heated mass was worked over and over by special tools in the hands of skilled workmen. The slag or cinder which forms, is thus worked into the metal, so that it possesses the structure of a bundle of fibers, each of which is coated with a film of cinder, which protects it from rust. It is obvious that the high price of labor will not permit hand-worked metal to compete with that produced by modern methods, but it has been proposed to use a form of mechanical puddling which will be capable of treating at one time charges of metal as large as those used in the Bessemer process. It is probable that this will eventually furnish a solution of the difficulty.

### A New Alloy.

The singular property of contracting instead of expanding under the influence of heat is characteristic of an alloy recently invented. The constituents of the alloy are nickel and steel, each of which metals when alone expands considerably when heated, so that the alloy is all the more remarkable. Correct measurements, however, have shown that the alloy, after being heated, expands less than marble or wood, and even contracts under certain conditions.

The importance of this invention is extraordinary. For scientific as well as for practical purposes, measuring instruments of the new alloy will render most superior service. Already, articles for tropical surveys are being made of it. Such measurements have always suffered from certain inaccuracies, due to the unavoidable expansion of the metals of which the instruments were composed, and numerous remeasurements have been necessary. Measuring sticks for laboratories, as well as for official gauging, are also to be made of this new alloy, to which the inventor has given the name of invar. The unrest of naval chronometers through the effect of temperature can be corrected by the aid of invar, and deviations can be reduced to an incalculable minimum. It is evident that pendulums of the new alloy must likewise have the advantage of an even and unchangeable swing, and observatory tests have shown that they need no equalizing attachments, but may consist only of rods.

### Harder Than the Diamond.

That nothing in nature is harder than a diamond and that a diamond alone can cut a diamond, is a popular belief of long standing. Yet there is something harder. A new substance has made its appearance which, if it can be obtained in sufficient quantity, will probably replace the diamond alike in the operations of drill boring and in the lapidary's workshop, for it is harder than the diamond; so hard, in fact, that the only effect produced by a diamond drill, worked day and night for three days on a sheet of the substance one twenty-fifth of an inch thick, with a speed of 5,000 revolutions a minute, was a slight dint in the sheet and the wearing out of the diamond. This substance is pure-metallic tantalum.

Tantalum is not a common metal, yet it is also not one of the rarest. Its existence was discovered more than a century ago. It differs from all other known substances in combining extreme hardness with extreme ductility. When red hot, it is easily rolled into bars, and sheets are drawn into wire. It is scarcely affected by the oxygen of the air, even at a red heat, and not at all at ordinary temperatures, and the strongest acids fail to dissolve it; nor does it amalgamate with mercury. It melts only at the highest attainable temperatures, and is therefore well fitted to serve for filaments in incandescent lamps, being much stronger than carbon. A pound of it will make 20,000 lamps, and these require only half as much power to light them as do carbon filaments giving the same brilliancy.

If only it can be procured in sufficient quantity, tantalum should prove a most useful metal. It will furnish better boring tools than the diamond

drill, and cheaper electric lights than carbon, while the possible uses of a plate or a wire harder than diamond, and yet tough and strong, are almost infinite, for every other hard substance is brittle, and this fact has hampered the engineer for centuries.

### New Railway Signal.

A system for signaling with electric lights has been recently tested in Canada, in the presence of experts from the leading railway companies. The apparatus was fitted up to represent five stations of a railway line, each station having a switchboard with two lamps, a bell and four switches. The two outer switches are for turning on the lights when a signal is to be given along the line, either to the left or right of the signaling station, or in both directions. One of the inner switches is for turning on the current when the officials of the station are leaving for the night, so that there can be no interruption of signals between the other stations.

In case the night switch is not put on, the next calling station is advised by telegraph of the departure or arrival of a train in the usual way, and accidents can thus be prevented. As the signal lights cannot be turned on beyond the negligent night station, which is intermediate, the calling station will be able to turn on the signals from this point "backward" to the night station, thus insuring the continuity of signals from one station to the other.

The signal lights are placed on every other telegraph post on the line, and each is fitted with a plug, so that if there is a breakdown, after leaving a station, the engineer need only insert the plug in the slot in order to be able to advise both stations of the mishap. By the use of a code, he can then explain what the accident is and what he requires.

If there is any train on the line which is not on time, all the other trains, by a regular succession of signals, can be warned of it. Power can be obtained from any point for use on the system, and short circuiting is prevented by the use of three wires. The only drawback about the device is the cost of installation, which is said to be about \$300 per mile.

### Silk from Spider Webs.

The spider is about to be made to compete with the silkworm, in the production of the glossy fabric so necessary to the feminine world. From an industrial point of view, the silk of the spinning spider has been known for years, and in Paraguay, Venezuela, and other tropical countries, the web has occasionally been utilized for cloth making. The present attempts, however, are confined to a genus of spider found in Madagascar, the webs of which are large and strong. It is said that these strands, spun across the boughs of trees, can support a light bamboo walking cane. A piece of fabric, eighteen inches wide and eighteen yards long, has been made of the web. It retains its natural color—a shimmering yellow—and is said by those to whom it has been exhibited to be of beautiful quality.

The promoters of this enterprise encountered the difficulties which always attend the first steps of a new industry. For the fabric described, it was necessary to provide 100,000 yards of spun thread of 24 strands. In its manufacture, 25,000 spiders had to be

brought into requisition, and these were procured by offering the natives of Madagascar so much per hundred. But in their ignorance of the purposes for which the insects were desired, and with a get-rich-quick ambition, they brought them in by basketsful, mostly dead. So it was found necessary for the apparatus to be taken to the spiders, instead of bringing the spiders to the filatories. Another difficulty lay in securing the thread. It was desired to obtain it direct from the living spider, and there was finally contrived a mechanism for winding it off the insect. The latter was confined in an empty match box, with the abdomen protruding, and this was to be compared with a reel, from which the machine obtained the strands. The extraction of the web does not apparently inconvenience the spiders, but care must be taken not to injure them. From that device was derived a frame of 24 small guillotines, in each of which a spider is secured in such a manner that on one side protrudes the abdomen, while on the other head, thorax and legs are allowed free play. This precaution of keeping the legs out of the way is necessary, as the spider, when the secretion is being spun off in this fashion, is liable to break off the web with its legs. The spinning spider is a female, black in color, and several inches long.

In early attempts to rear the spiders, 200 were placed in a wire cloth cage; they spun their webs over the walls of their prison until it was so completely covered that no flies or mosquitoes could enter. Thus deprived of food, on the principle of the survival of the fittest the stronger went to devouring the weaker, until only a few, swollen to Gargantuan size, remained.

It has been found that the web can be reeled off five or six times in the course of a month, after which the spider dies, having yielded about 4,000 yards. Native girls do the work. Each one has a straw basket at her side filled with live spiders, and another one to receive them after they have been wound off. A dozen are locked into the machine at a time, the ends of their webs being drawn out and collected into one thread. This is passed over a metal hook and the reel is set in motion by a pedal. As soon as an insect ceases to yield the web, it is replaced without stopping the wheel, and later it is taken outdoors and allowed to rest for five or six days. It is then ready for a second operation.

The cost of spider silk is high: the time and labor of procuring and preparing it bring it up to \$40 a pound, and it would be thought that this would make it commercially prohibitive. There will doubtless be an unlimited demand for it, however, on the part of those who desire a novel and unique fabric.

### Vapor Electric Apparatus.

An improvement in Vapor Electric Apparatus has been invented by Alexander M. Jackson, of Schenectady, New York. It relates to mercury vapor lamps, rectifiers or the like, in which devices it is a common practice to make use of anodes not only of mercury, but also of graphite, iron or similar non-vaporizable material. During normal operation these non-vaporizable anodes frequently run at a red heat, and thus are subject to slow disintegration. The patentee found that this difficulty may be overcome, and certain additional advantages secured, by surrounding the anode or anodes with a body of mercury. This mercury prevents an undue rise in temperature of the anode, without interfering with the attainment of the advantages characteristic of anodes of non-vaporizable material.



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Garment. Nursing..... W. L. Bailie, Jr  
Gas burner. Safety..... C. H. White  
Gas burners. Automatic lighter and extinguisher for..... J. L. Bruce  
Gas generator..... J. G. L. Borman  
Gas generator. Acetylene..... J. B. Dulaney  
Gas generator. Acetylene..... 2 pats. O. M. Brauer  
Gas generator. Acetylene..... L. C. Gilmore  
Gas light. Incandescent..... S. Mason  
Gas Manufacturing..... L. P. Lowe  
Gas pipes. Automatic alarm for A. L. Schultz  
Gas producing and consuming apparatus..... C. Ellis  
Gas washing machine..... L. P. Lowe  
Gate..... G. B. Brace  
Gem setting..... A. Pollard  
Glass from quartz sand, &c. Manufacture of quartz..... J. Bredel  
Glass. Manufacture of articles from quartz..... J. Bredel  
Glazing device..... F. W. Mellowes  
Governor for steam systems and meter therefor..... J. Morehead  
Grain separator sieve cleaner..... F. Frinz  
Graphophone reproducer..... W. Hart  
Grate bar..... A. Wilkinson  
Grate. Gas..... A. D. Rathbone  
Gun..... M. F. Smith  
Gun. Breech loading..... A. H. Russell  
Gun locks. Safety lock for M. P. Rogers et al  
Gun. Spring air..... L. Jeffries  
Hair pin..... G. H. Bigelow  
Halter..... W. J. Smouse  
Hames. Draft attachment for..... F. J. Martin  
Harness peg attachment..... E. D. Wallace  
Harrow draft attachment. Sidehill..... M. C. Machado  
Harvester attachment. Core..... H. Moening  
Harvesting machine. Beet..... C. L. Winterburn  
Hat fastener..... H. Siedentop  
Hay and stock rack..... D. M. Cox  
Hay carrier..... F. M. Yentzer  
Hay from corn and other stalks. Machine for making..... C. H. Trask  
Heating furnace. Hot water..... S. Lindner et al  
Heating system Vacuum..... C. A. Dunham  
Heel loading machine..... A. F. Preston  
Helical spring..... R. Siegfried  
Helmet and face protector. Combined..... S. J. Lavis  
Hoisting apparatus. Electrical A. E. Norris  
Hoof cutter Horse..... D. McDonald  
Hook and eye..... A. B. Dabney  
Horse power indicator and engine overhead..... J. F. Shreffler  
Horseshoe..... J. Swigert  
Hose..... E. T. Greenfield  
Hose coupling..... C. E. Bewley  
Hose coupling. Armored..... E. T. Greenfield  
Hose coupling. Internally and externally armored..... N. Perzoff  
Hot blast furnace..... I. M. McClave  
Hub at aching device..... E. H. Therington  
Ice cream freezer..... J. E. Dunne et al  
Ice cream freezer..... C. E. Molesworth  
Ice cream freezer..... J. A. Snigo  
Illusion device..... F. N. Reeves  
Insulated support for double wire electric lines. Portable..... A. Collet  
Invalid lift and bed support. Combined..... H. Williams  
Ironing board..... A. Wallace  
Jeweler's implement..... W. F. Brown  
Journal bearing..... P. A. Whitney  
Keys, windows, &c. Fastening device for..... A. C. Fletcher  
Kneading trough..... A. Schmid Keller  
Knockdown box..... J. J. White  
Ladders. Antislip attachment for..... H. D. Hinckley  
Lamp. Carbureting..... E. B. Ludwig  
Lamp chimney fastener..... J. Stewart  
Lamp switching device. Electric..... J. McCullough  
Lamps. Adjustable support for incandescent electric..... O. T. Bauks  
Lantern mechanism. Vehicle..... W. B. White  
Lasting machine..... C. V. de Lummen  
Latch. Spring..... J. L. Zesiger  
Lens grinding tool..... J. L. Borsch, Jr  
Life net..... F. S. Fearington  
Life saving apparatus..... A. Piller  
Limb Artificial..... H. Leonard  
Lining tool. Hand..... E. R. Harris  
Linotype machine..... R. M. Bedell  
Linotype machine..... P. T. Dodge  
Lock..... E. R. Booth  
Lock..... O. H. P. Green et al  
Locomotive attachment..... S. G. Stevens  
Logging apparatus..... J. Butler  
Loom selvage stop motion E. G. Gustafson et al  
Looms. Hopper for filling replenishing..... E. Cuniff  
Lubricating device..... W. E. Moore et al  
Lubricating mechanism..... C. C. Riote  
Magnesium perborate..... O. Liebknecht  
Mail bag delivery apparatus..... J. T. Nash  
Mail carrier. Electric automatic M. Danner  
Mail case..... A. Robinson  
Mail delivery apparatus..... H. McCabe  
Mail deposit box Letter carrier's T. V. Davis  
Mailing card. Photographic..... S. A. Markoff  
Marine lock..... J. Diamant  
Massage appliance..... E. S. Saighman  
Massaging machine. Hand gear vibratory..... J. V. Daniels  
Match box. Single delivery..... C. Hunnicutt  
Match machine..... W. H. Wyman  
Match making machinery..... B. G. Vaughan  
Meat tender and vegetable chopper..... F. Beckman  
Medical appliance..... F. S. Russell  
Merry-go-round..... C. M. Stevenson  
Metal bars or rods. Machine for making..... J. W. Mosher  
Metal teeming apparatus..... H. S. Heichert  
Metallic tube. Flexible..... E. T. Greenfield  
Metallurgical furnace..... G. H. Benjamin  
Milling machine..... D. Klein  
Miner's drill..... 2 pats. C. C. Cranmer  
Mirror holder..... C. B. Moore  
Moistening device..... J. H. De Nike  
Molding machine..... D. D. Tracy et al  
Molding machine..... D. A. Schoeneman  
Molds. Composition for..... J. G. Weyer  
Mob head and wringer. Combined..... N. Scholl  
Mosquito net frame..... E. L. Awtry  
Motion. Mechanism for converting rotary in to reciprocatory..... L. Neumann  
Motor control system..... 4 pats. A. Magnuson  
Motors. Flexible connection and suspension device for gearless..... R. Siegfried  
Motors. Flexible connection and suspension means for gearless..... K. F. Elers  
Motors. Flexible connection for gearless..... 2 pats. R. Siegfried  
Mount..... E. S. Cheney  
Mowing machine cutting apparatus..... S. Davis  
Music leaf turner..... J. A. Bittig  
Musical instruments. Straining hook for..... A. G. Soistmann  
Nitrogen. Preparing and growing and distributing organisms which fix or gather atmospheric..... G. H. Earp-Thomas  
Oculometer..... H. I. Cowan et al  
Oil burner..... M. N. Macrate  
Oilstone box..... C. F. Pippy  
Optical tool..... L. E. Capps  
Oven regulator. Automatic..... J. P. Farmer  
Packing gasket..... J. A. Landstberger  
Paint and varnish remover. Non-inflammable..... C. Ellis  
Paper binder..... F. N. Volkert  
Paper embossing apparatus..... T. Hawkins  
Paper making. Apparatus for dissolving size for..... B. Kniffler  
Paper making. Dissolving size for..... 2 pats. B. Kniffler  
Paper winding machine..... 2 pats. J. A. White  
Paste pot cover..... E. Hoffman  
Pedal guard..... C. H. Woodall  
Pen and pencil holder..... S. Cotler  
Permutation lock..... C. E. Bleeschmidt  
Phonograph Magazine..... C. C. Shigley  
Photographic sheet..... W. H. James  
Photography. Reducing agent or composition for use in..... H. E. Smith  
Piano..... W. D. Callow  
Piano. Automatic combination..... N. D. Hosley  
Piano player. Automatic..... J. Sampere  
Piling. Inter locking sheet..... G. E. Nye  
Piling. Sheet..... H. L. Zander  
Pin..... F. J. Kristofek  
Pipes, &c. Machine for flanging, socketing, or otherwise shaping earthenware..... R. O. Clark, Jr  
Pitcher. Ice..... J. Krakauer  
Plane handle. Adjustable..... F. A. Shontz  
Planes. Reversible handle attachment for..... R. Hunter  
Plastic material. Method of and apparatus for making striped fabric from..... J. L. Mahoney  
Plate securer..... T. Frazier  
Plow..... E. M. Heylman  
Plow. Reversible disk..... W. G. Jobling  
Plow. Sulky..... W. L. Beall  
Plug..... M. W. Gartshore et al  
Plumber's fitting and pipe support. Combined..... J. L. Fruin  
Pneumatic despatching tube system..... J. J. Stoetzel  
Pompador wave..... F. M. & S. E. Delavan  
Post cards. Holder for illustrated..... E. J. Early  
Potato digging machines. Shield for..... F. M. Murray  
Power transmission device. Dynamo magnetic..... J. O. Heinze, Jr  
Printing films. Universal adjuster for..... B. Day  
Printing press cutting attachment..... J. W. Smith et al  
Printing yarns. Apparatus for..... A. Hofmann  
Projectile. Steel..... A. Haase  
Propeller. Screw..... E. E. Adams  
Propelling mechanism..... D. W. Rantine  
Pulley block. Ball bearing..... E. E. La Rose  
Pulp strainer. Oscillating cylindrical..... H. Sanguinetti  
Pump. Adjustable pressure..... E. S. Clark  
Pump. Lift..... H. M. Crow  
Pump rod. Windmill..... J. Lueck  
Punch holder..... W. H. Froggatt, Jr  
Rail fastener..... E. T. Forrester  
Rail joint..... G. H. Marshall et al  
Rail joint..... W. Daves  
Rail joint..... W. A. Hill  
Rail securing means..... T. Gardin  
Rails. Iron framed wood pad for track..... G. Borini  
Railway brake..... T. Bell  
Railway composite tie..... W. Goldie  
Railway cross tie..... J. Kahn  
Railway frog and crossing..... E. Hayward  
Railway motors. Suspension means for electric..... C. A. Psilander  
Railway pile driver and the like..... S. L. G. Knox et al  
Railway rail stay..... 2 pats. H. H. Sponenburg  
Railway signal. Automatic..... J. Neumaier  
Railway signal operating mechanism..... W. V. Moak  
Railway spike..... C. M. Kerr  
Railway tie..... H. H. Clough  
Railway tie..... H. W. Taylor et al  
Railway tie..... J. F. Bailey  
Railway tie..... J. Kenny  
Railway tie and fastener..... J. P. Lancaster  
Railway tie and rail fastener therefor..... G. S. Myers  
Railway tie plate and means for securing rails thereto..... H. H. Clough  
Railway ties. Making composite..... W. Goldie  
Razor strop..... E. F. Zarbock  
Reaper or mower blade head..... M. Smith et al  
Reflector and socket hood. Combined..... W. H. Spencer



Refrigerator..... G. W. Wallick  
Road working machine... W. J. McBride et al  
Roofing..... H. M. Jackson  
Roofing material. Machine for making..... F. D. Jacobs  
Rotary engine..... J. M. King  
Rotary engine..... P. C. Dahl  
Rubber from canvas, metal and other material  
Apparatus for separating..... H. Penner  
Rubber tubing. Striped..... J. L. Mahoney  
Sash adjuster..... H. E. Keeler  
Sash and frame. Metallic window..... J. Tyra  
Sash cord fastener..... L. H. Broome  
Sash lock..... F. M. Coleman  
Saw handle..... M. Sawyer  
Saw swage..... A. E. White  
Saw tooth. Inserted..... W. S. McLean et al  
Scale. Automatic weighing and computing..... T. A. Killman  
Scale Computing..... J. W. Cramer  
Scale register..... M. Schmidt  
Scarf holder..... A. Rosland  
Seat and life raft. Combined C. & C. S. Taylor  
Seed cleaning apparatus..... D. P. Cooley  
Sewing machine button sewing attachment..... C. E. Ongley  
Shade bracket and curtain pole support..... J. E. Forehand  
Shade roller pulley. Window..... L. Z. Pouliot  
Sharpening machine. Drill..... J. C. Jeffrey  
Sharpening machine. Drill..... J. J. Brossoit  
Shock support..... B. B. Peete  
Shower bath..... C. C. Russell  
Shutters, &c. Mechanism for operating..... E. Prescott  
Sidewalk light..... C. H. Ross et al  
Sign. Changeable illuminated..... G. J. & H. G. Pelstring  
Sign. Street..... B. W. Griffin  
Sink cleaner..... G. A. Keene  
Siphon head..... D. Landau  
Siphon stand and charging apparatus..... D. Landau  
Slate picking machine..... W. J. Devers  
Sled propelling mechanism..... W. C. King et al  
Smelting lead ores..... W. Valentine et al  
Smelting lead sulfid..... 2 pats. A. G. Betts  
Smoke consumer..... 2 pats. T. Rees  
Smoking pipe..... M. Donohoe  
Soap holder..... C. Howard  
Sofa and table. Convertible..... N. B. Stone  
Solder rings to metal caps. Machine for securing..... F. W. Schultz  
Solder to metal caps. Machine for forming and securing..... F. W. Schultz  
Sound box..... J. Gaynor  
Sound recording device..... H. P. Roberts  
Speedometer..... J. H. Bullard  
Spinning and twisting machine..... J. R. Milson  
Spinning filer..... W. Beckwith  
Starch molding machine. Lump T. B. Wagner  
Steam and hot water boiler..... M. Dean  
Steam condensing apparatus..... D. B. Morison  
Sterilizer Basin..... H. W. Shonard  
Sterilizing and antiseptic case with stand for surgical instruments..... P. Briganti  
Stone cutting saw..... 2 pats. J. S. Young  
Stool Camp..... C. Erickson  
Storage battery..... W. H. Palmer, Jr  
Stove lifter and mover..... J. Wood  
Stoves and furnaces. Door for hot blast..... J. Kennedy  
Street cleaner..... J. G. Sanderson  
Stringed instrument attachment..... G. P. Buchanan  
Stud. Fastening..... H. M. Cheek  
Stuffing box for traveling cables, rods, &c..... S. W. Chiles  
Stuffing machine..... M. Mazerov  
Sugar, &c. Crystallizing..... V. H. Schutze  
Superheater..... N. Notkin  
Surfacing and polishing machine..... A. T. Spence et al  
Surgical truss..... J. Leverone  
Suspensory..... J. R. Sommerville  
Switch mechanism..... W. C. Mortensen et al  
Switch throwing device..... G. W. Hercules et al  
Syringe..... D. G. Gay  
Talking machine..... H. J. Hagen  
Talking machine..... E. A. Pancoast  
Tank lining. Wooden..... F. E. Reed et al  
Tank or can..... J. W. Wallace et al  
Tank sections. Apparatus for use in perforating the flanges of..... D. O. Paige  
Tanning apparatus. Leather H. de Marneffe  
Telephone desk stand..... H. Tideman  
Telephone exchanges. Iron framed distributing board for..... F. B. Cook  
Telephone switchboard apparatus..... H. F. A. Andre  
Telephone system controller. Automatic..... A. E. Stevens  
Telephone system. Two division..... H. M. Post  
Telephone transmitter..... W. W. Dean  
Textile fibers. Retting process for..... A. Van Steenkiste  
Theater chair..... J. E. Chase et al  
Thill coupling..... A. Pflugradt  
Thill coupling..... C. F. Blain et al  
Thill. Vehicle..... A. Lott  
Tile construction. Illuminating P. H. Jackson  
Time recorder. Employee's..... F. Brook  
Tire. Detachable pneumatic..... C. S. Scott  
Tire. Flexible..... A. V. Suchlen  
Tire. Pneumatic..... S. Hunter  
Tongue. Threshing machine..... W. Farber  
Tool. Combination..... O. Medhus  
Tool. Combination hand R. G. Shallenberger  
Transporting and heat interchanging appliance..... E. R. Besemfelder  
Trap..... E. J. Ryan  
Trolley harp..... B. Murphy  
Trousers press..... I. R. Fenner  
Truck..... J. Schreiber  
Trucks. Means for adjusting the height of spring planks for railway..... M. Linton  
Tube expander..... W. Nicholson, Jr  
Tube forming machine. Metal E. T. Greenfield  
Turbine..... J. T. Jennings  
Turbine. Expandable fluid reissue B. S. Church  
Turn table. Automobile..... E. A. Turner  
Twine holder..... O. S. Gage  
Type writer..... 2 pats. W. Baxter, Jr  
Type writing machine 2 pats. E. F. Kunath  
Undergarment and testes supporter. Combined..... W. C. A. Bullock  
Undergarment. Union..... J. Pennington  
Valve and cock..... F. C. Buck  
Valve and trap. Automatic relief..... A. Harrison

Valve. Combined stop and check..... L. Kaczander  
Valve controlling mechanism for gas engines..... H. J. Podiesak  
Valve for pneumatic hammer. Throttle..... H. S. Potter  
Valve for regenerative furnaces. Reversing..... J. B. Nau  
Valve. Piston..... W. Schmidt  
Vegetable boiler..... A. M. Ham  
Vehicle body..... D. W. Connell  
Vehicle brake..... J. N. Everett  
Vehicle for cripples..... F. Rowley  
Vehicle running gear..... E. Einfeidt  
Vehicle spring. Pneumatic or elastic..... W. H. Staats  
Vehicle steering mechanism. Motor..... C. M. J. Petiet  
Vehicle wheel..... H. B. Gillette  
Vending device..... S. C. Gilbert  
Vending machine..... J. W. Peden  
Ventilator..... A. Rasmussen  
Vessel. Metallic..... C. L. Coffin  
Wagon brake..... G. L. Adams  
Warper comb..... A. E. Rhoades  
Waste and vent fitting. Combined G. F. Ryan  
Watch barrel arbor..... J. W. Gibson  
Water circulating apparatus..... J. N. Russell  
Water heater..... H. S. Humphrey  
Water wheel..... J. L. Shelton  
Wave motor..... C. E. Newell  
Watering device..... A. N. Church  
Weeder and cultivator..... J. E. & F. L. Elder  
Weeder attachment..... C. D. Eddy  
Well drilling machine..... J. W. Miller  
Well..... G. E. Rollins  
Wheel barrow shoe..... M. V. Garver  
Wick Candle..... G. Genovese et al  
Window..... A. E. Hull  
Window screen. Self adjusting W. H. Sawvel  
Woven fabric. Elastic..... H. T. Sykes

## DESIGNS.

Handle. Drop..... G. A. Schehr  
Knit fabric..... 2 pats. C. H. French  
Rug..... 3 pats. E. H. B. nnett  
Show case..... W. M. McLean  
Spoons, forks, or similar articles. Handle for..... C. M. Prior  
Spoons, forks, or similar articles. Handle for..... C. B. Shepard  
Stove..... R. Thiem

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## MECHANICAL PATENTS.

Acetylene chlorid. Making..... H. Precht  
Acids and ketones. Making carbon..... H. S. Blackmore  
Acids. Making dialkylbarbituric M. Conrad  
Adhesive applying device..... O. Hesser  
Agricultural implement..... C. D. Adams  
Air and gas engine..... A. O. Haney  
Air ship..... C. F. Page  
Amusement apparatus..... C. A. Carlson et al  
Amusement apparatus..... C. I. Matson  
Amusement apparatus..... W. H. Strickler  
Amusement device..... M. Stolz  
Amusement device..... C. F. Hartway  
Animal shears..... J. D. Scovel  
Atomizer. Coin controlled..... P. A. Dunn  
Back and bust supporter..... S. Meyer  
Bait. Revolving spinning..... J. H. Lee  
Ball player's shoulder guard. Foot..... J. B. McCalla  
Barrel. Collapsible..... J. H. Durant  
Batteries. Treating alkaline storage..... T. A. Edison  
Bearing. Ball..... B. G. Goble  
Bed Folding..... W. C. James  
Bedstead. Adjustable..... E. A. Barnes  
Bedsteads. Crib attachment for..... H. T. Beall et al  
Belt fastener..... J. Millar  
Benzoylalkylaminoethanols and making same..... T. Emilewicz  
Bicycles. Power transmitting mechanism for..... L. Combet  
Bleaching composition..... A. E. Nienstadt  
Blouse..... A. G. Huth  
Boiler stay bolt..... N. B. Jarriel  
Boot and shoe manufacture. Nailing, slugging or like machine for use in..... W. E. Maddison et al  
Boot and shoe tacking machine..... E. Nolle  
Boots and shoes. Apparatus for rubbing or treating..... M. J. Smith  
Boring tool and arbor..... H. Kootz et al  
Bottle..... I. F. Gordon  
Bottle closure..... A. M. Taylor  
Bottle neck..... T. A. Huffer  
Bottle. Non refillable..... J. Meermans  
Bottle. Non refillable..... A. Feraro  
Bottle. Self sealing..... W. A. Miller  
Bottle stopper..... I. Madir  
Bowling alley..... D. F. McCarthy  
Box covering machine..... G. A. Diemer  
Box nailing machine..... E. C. Northrup  
Brake shoe..... C. W. Armbrust  
Braking and clutch mechanisms. Cooling system for..... J. F. Metten  
Bread raiser..... C. H. Marshall  
Brick pallet..... F. Bentley  
Bridge. Movable..... T. Rail  
Brush. Expandable..... D. J. Purdy  
Brush or puff. Powder..... E. Chaquette  
Buckle..... E. A. McMillen  
Buckle. Detachable..... M. Barabasz  
Building block molding machine..... L. P. Normandin  
Building construction..... G. F. Fisher  
Bulkhead doors. Hydraulic apparatus for opening and shutting..... H. O. Brandt  
Buoy. Bell..... T. Weber  
Butter cutter..... 2 pats. A. C. Hummer  
Butter patty forming machine..... G. A. Walstead  
Button..... A. Hall  
Button..... W. H. Forsyth  
Button. Collar..... G. X. Wendling  
Cabinet. Kitchen..... C. G. Swahn  
Cable or rope guide..... G. Frink  
Cable terminal or coupling. Electric..... W. & J. Y. Middleton  
Cables. Forming wire..... C. S. Lloyd  
Calendar. Pencil tip..... F. J. Matheis  
Camera. Pocket..... 3 pats. F. Heath

Camera support..... H. L. Wheeler  
Can cover lining machine..... J. Brenzinger  
Candle holder..... A. Schluter, Jr  
Candy forming machine..... J. A. Hollowell  
Cane and stool. Combined walking..... W. R. Jones  
Canopy tops. Means for attaching..... W. C. Rands  
Cap..... O. D. Shaw  
Capsule filling apparatus..... C. C. Boykin  
Car bolster. Trussed..... A. Stucki  
Car controlling device. Electric..... J. H. K. McCollum  
Car coupling..... W. A. Engel  
Car coupling..... H. N. Poynton  
Car derailler..... W. Roach  
Car draft gear. Railway..... L. P. Mather  
Car fender. Safety..... F. Cushman  
Car fender. Street..... D. Houlihan  
Car rail hose bridge..... J. S. Heaton  
Car step. Folding..... T. G. Clifford  
Car storm curtain. Open..... M. E. Holden  
Car wheel..... J. Taylor  
Car wheel..... P. J. Garrison  
Car wheel jack stand..... L. C. Houston  
Cars. Electric switch for electric railway..... O. Frank et al  
Carbureter..... W. & J. Brown  
Carbureter..... C. B. Harris  
Carbureter..... J. C. Lewis  
Cash register..... F. C. Osborn  
Casting crucible steel. Apparatus for..... L. E. Howard  
Cattle guard..... J. W. Gorsuch et al  
Cement block molding machine..... S. L. Witte  
Cement manufacturing apparatus..... C. Ellis  
Cement posts. Method and machine for forming..... A. P. Robertson  
Chain guide for pull sockets..... H. Hubbell  
Chains. Die for curbing..... F. R. Bishop  
Change maker..... C. C. Spengler  
Chuck. Rock drill..... T. E. Adams  
Churn..... J. L. Forbes  
Chute. Spiral..... M. C. Schwab  
Cigar bunching machine..... A. S. Koch  
Cigar rolling table and wrapper cutter..... B. Liberman  
Circuit breaker. Automatic time..... E. T. Browning  
Closet seat. Detachable..... J. T. Baily  
Clutch..... L. W. G. Flynt  
Clutch. Electrical friction..... H. A. Williams  
Clutch. Magnetic friction..... H. A. Williams  
Cock for steam cylinders. Drain S. Anderson  
Coffee roaster..... F. E. J. Thoreen  
Coffee roaster..... L. Schmidt  
Collar. Horse..... J. Ahrendt  
Column Building..... T. L. Green  
Combination lock..... E. E. Quaintance  
Compasses. Ellipse..... C. E. Keel  
Computing machine..... D. W. Shiek  
Concrete piles. Setting..... F. Shuman  
Condenser..... C. H. Wheeler et al  
Conduits. Apparatus for making fibrous..... S. Palmer et al  
Contact device..... A. Plecher  
Conveyer. Gravity..... M. C. Schwab  
Cooking utensil..... H. Elsnor  
Corn crib..... J. W. Engelke  
Cotton chopper..... G. R. Robinson  
Cotton chopper..... J. M. Andrews  
Cotton scraper attachment..... C. O. Dye  
Coupling device. Auxiliary..... G. W. Scott  
Cupola..... A. Bailiot  
Curtain bracket..... G. E. Quittmeyer  
Curtain fastener..... N. A. Ferres  
Cuspidors. Portable cabinet for..... A. Heagale  
Cut off. Automatic..... P. C. Hansen  
Cutting head..... W. B. Huther  
Dampener..... J. R. McCord  
Dampener regulator and motor therefor..... O. Saugstad  
Derrick. Revolving..... J. A. Glancey  
Die stock. Adjustable..... B. Borden  
Disinfecting compound..... J. W. England  
Display apparatus..... C. Jackson  
Display rack..... E. Bollhoefer  
Display rack..... O. & O. Justice  
Display stand..... C. H. Wheeler  
Door closer and check..... A. J. Rosentretter  
Door frame..... S. P. Stevenson  
Door holding catch..... G. Young  
Door jamb and weather strip..... C. E. Seeley  
Door lock and latch..... W. H. Hope  
Door spring..... D. S. Flory  
Dough mixer..... R. W. Jamieson  
Dough or bread mixer..... I. Stanley  
Draft equalizer. Transformable..... W. M. Rich  
Drier..... J. R. Hussey  
Drill rod coupling..... V. G. Smith  
Drilling nuts and the like. Machine for..... M. Nelson  
Drum. Heating..... J. M. J. Ness  
Eccentric..... F. M. Berger  
Egg beater..... G. R. Flowers  
Egg beater holder..... E. L. Persons  
Egg. Medicated nest..... G. H. Jones  
Electric brake..... G. R. Yancey  
Electric circuit controller. Automatic..... H. W. Leonard  
Electric circuit regulation..... E. A. Edwards  
Electric currents passing through lamps, &c. Apparatus for commutating..... C. Smart  
Electric furnace..... C. O. Wingren  
Electric light cord adjuster..... J. T. & T. H. Hatherly  
Electric meter..... T. Duncan  
Electric switch..... H. E. Case  
Electric time switch..... C. E. Katsch  
Electric time switch..... J. E. Rogers  
Electrical circuit controller..... H. W. Leonard  
Elevator safety device..... F. Lundsten  
Emery wheels. Tools for truing..... L. A. Sherman  
Engine starting device. Explosive..... G. N. McMillan  
Engines. Supply controlling mechanism for gas..... F. K. De la Saulx  
Exhibiting machines. Clutch mechanism for..... J. C. Liebhart  
Facing tool..... J. D. Mitchell  
Feed mechanism. Roller..... W. M. Allen  
Fence post..... G. H. Kanfan  
Fence post. Composition..... D. C. Stewart  
Fender fastener..... B. E. Thompson  
File. Account..... J. O. Wilhelm  
Film support..... H. E. Baer  
Filter..... 2 pats. G. M. Kneuper  
Fire alarm signal box..... M. J. McGowan, Jr  
Firearm. Gas operated..... M. F. Smith

Fireproof window..... O. M. Otte  
Floor dressing device..... C. W. Swanson  
Floor dressing machine..... C. B. Watties  
Flue cutter..... W. Hoffa  
Folding box..... H. W. Stuart  
Form. Garment..... E. T. Palmenberg  
Furnaces. Fire screen for locomotive..... J. Minnich  
Furnaces. Regulation of..... E. McLean  
Fuse igniting apparatus. Electric..... J. W. Howard  
Fuses. Automatic setting key for setting the firing charge rings of time..... L. Beck  
Gage..... P. Layman  
Gage line holder..... F. G. Zugeder  
Game apparatus..... J. V. Emmerling  
Game apparatus fastening device..... G. H. Bailey  
Game. Foot ball card..... L. G. Robinson  
Garment fastening..... P. A. C. Bates  
Gas burner..... A. C. Mouser  
Gas igniter. Automatic..... A. B. Handschug  
Gas making apparatus 2 pats. L. P. Lowe  
Gas manufacturing and delivering apparatus..... L. P. Lowe  
Gas. Producing..... J. S. Smith  
Gas producing apparatus..... J. S. Smith  
Gas purifier..... L. P. Lowe  
Gas shut off. Automatic..... C. J. McCormick  
Gas tubing or the like. Detachable clamp for..... T. Vogt et al  
Gasolene dispensing can..... W. H. Robertshaw  
Gear for skips, cages, and the like. Safety..... J. W. Campbell  
Gearing..... S. Graves  
Ginning or burring machine..... W. Youlton  
Glass article molding apparatus F. J. Mackin  
Glazing or rolling machine..... B. & G. McKeen  
Governor. Marine engine..... J. W. Mowbray  
Gun. Gas operated machine..... M. F. Smith  
Hair and hat securing device..... I. Frechette  
Hame clasp..... A. Schaefer  
Hammock support..... J. M. Troselj  
Harrow tooth fastener..... L. E. Allen  
Harvester. Cotton 2 pats. T. H. Price et al  
Harvesters, &c. Guard finger for..... F. Hamacheck  
Harvesting machine. Corn..... C. E. Storm  
Hay rack..... A. E. Cranston  
Heat coil..... F. B. Cook  
Heating and ventilating system..... W. R. McKeen, Jr  
Heating apparatus..... C. F. Jenkins  
Heating or cooling apparatus. Surface..... G. F. Jarvis  
Hitching post strap..... J. A. Ames  
Hog trough..... J. Crossin  
Hoisting drum..... A. E. Norris  
Hoof trimmer and cleaner..... J. L. Kottas  
Horse detacher..... L. P. Faison  
Horse detacher..... J. Greece  
Horse releaser..... J. B. S. P. Twaha  
Horseshoe..... G. W. Johnson  
Horseshoe..... J. E. Shaffer  
Horseshoe calk..... W. F. Budenbach  
Horseshoe calk. Adjustable 2 pats. T. W. J. McGann  
Horseshoe heel calk. Detachable..... T. W. J. McGann  
Horseshoe. Nailless..... C. W. Crannell  
Horseshoe. Nailless..... R. H. Gibb et al  
Horseshoes. Detachable calk for rubber pad..... T. W. J. McGann  
Horseshoes. Detachable heel calk for composite rubber pad..... T. W. J. McGann  
Hose supporter..... M. M. Sturm et al  
Inclined elevator..... J. W. Reno  
Inhaler..... G. F. Hartz  
Injector..... E. Blahorn  
Insecticide..... A. Schulz  
Insulating screw shell..... H. Hubbell  
Invalid moving apparatus..... L. Garaghty  
Ironing board..... J. F. Siebenthal  
Jar attachment..... J. H. Johnson  
Journal bearing..... C. Skidmore  
Journal box..... G. L. Harvey  
Journal box..... M. H. Whalen  
Key fastener..... W. T. Easterday  
King bolt..... T. W. Donahoe  
Kitchen. Window. reissue I M Thompson  
Knife casing..... E. Kaufmann  
Ladder and bracket construction..... J. M. Jones  
Lamp cluster. Incandescent..... H. Hubbell  
Lamp. Electric hand..... H. F. Stakelbeck  
Lamp. Electric incandescent..... W. von Bolton  
Lamp or lantern..... C. L. Betts  
Lamps. Receptacle for incandescent electric..... 2 pats. A. P. Seymour  
Lantern globes. Lever lift for..... D. C. Kline  
Lantern. Tubular..... J. E. Johnson  
Lanterns. Ball support for..... A. R. Pritchard  
Lasting boots and shoes. Upper holding clamp for..... J. O. Jones  
Latch..... W. H. Taylor  
Lathes. Thread cutting tool for..... O. G. Simmons  
Lattice..... P. Jaeger  
Ledger. Loose leaf..... L. M. Landing  
Lenses. Machine for making bifocal..... T. Mundorff  
Level. Spirit..... N. D. Chase  
Lid holding tie..... A. W. Gaddum  
Life buoy..... J. Meller  
Lifting jack..... W. E. Gaston  
Light reflecting and directing apparatus..... A. Boas et al  
Lighting purposes. Incandescing body for..... W. von Bolton  
Limb. Artificial..... R. Rosenkranz  
Line guide..... W. R. McGowan  
Linotype machine..... D. S. Kennedy  
Liquid separator. Centrifugal..... G. J. Bragg  
Loading apparatus..... E. Ring  
Lock..... C. E. Turner et al  
Lock..... M. F. Hutchison  
Locomotive spark preventer..... D. Drummond  
Loom filling replenishing mechanism..... N. Foerster et al  
Loom temple..... F. Ott  
Loom weft replenishing mechanism..... N. Foerster  
Looms. Feeler stop motion for automatic..... J. A. Perkins et al  
Lubricating under pressure. Device for..... L. M. G. Delaunay-Belleville  
Lubricator..... G. Sloan  
Magnetic actuator..... D. Bacon  
Magnetic separation..... F. T. Snyder  
Mail bag clamp..... J. A. Engle  
Mailing box..... G. A. Owen



Mail box lids. Device for operating ..... A. Seaton  
Malt drying apparatus ..... E. Ellermann  
Manure distributor ..... S. H. Garst  
Measuring device for concrete mixers ..... J. Muir  
Measuring instrument ..... F. L. Traut  
Meat roller or ringer ..... B. L. Packard  
Medical appliance ..... J. P. Whedon  
Metal bending appliance ..... C. E. Pickrell  
Metal bending machine ..... A. W. Heinle  
Metal cutting and trimming machine ..... C. T. Murray  
Metal plates. Die for cutting out ..... C. B. Agar  
Metals. Homogeneous body of highly refractory ..... W. von Bolton  
Metallic structure ..... V. J. Niele  
Mill ..... D. L. Adelsperger  
Mineral deposits. Apparatus for detecting and localizing ..... L. Daft et al  
Molding machine ..... O. D. W. Inman  
Molding machine. Convertible ..... E. H. Reed  
Motor spring ..... A. M. Lane  
Motor wheel. Water ..... B. B. Bush  
Mower. Lawn ..... W. H. Coldwell  
Mud guard fastening ..... B. E. Thompson  
Music holder ..... J. L. Dodge  
Necktie ..... C. W. T. Davies  
Non-siphong trap ..... E. A. Cleland  
Numbering and stamping machine ..... J. D. Humphrey  
Oil engine ..... C. J. Rousseau et al  
Ore reducing furnace ..... H. F. Brown  
Ore separator ..... G. Moore  
Ores of the precious metals. Treating ..... A. C. Atwater  
Ores. Reducing ..... H. F. Brown  
Packing machine ..... J. A. Keyes  
Paddle wheel ..... J. B. Heggum  
Pail. Milk ..... J. Lowe  
Palette. Artist's ..... D. C. Smith  
Pantaloons creaser ..... J. Kulhawik  
Paper clip ..... J. Kuster  
Paper trimmer ..... A. J. Perks  
Pasteurizer ..... C. H. Loew  
Permutation lock ..... G. Elser  
Photograph and making same. Diffraction color ..... H. E. Ives  
Photographic postal or mailing card ..... G. N. Pifer  
Piano. Self-playing ..... G. W. Burchett  
Pick. Miner's ..... W. S. Palmer  
Picture frame jointer ..... J. E. Braggins  
Pie making machine ..... J. C. Hutchison  
Pipe coupling ..... O. E. David  
Pipe making machine ..... H. A. Williams  
Pipe pulling jack ..... H. B. Cunningham  
Pipe stem cleaner ..... B. F. Eshelman  
Piston ..... E. Moran  
Planter ..... H. P. Kilne  
Plastics. Apparatus for molding ..... G. T. McIntyre  
Plating. Apparatus for nickel ..... J. W. Aylsworth  
Plow ..... F. B. Niesz et al  
Plumber's clamp ..... R. Parker  
Pneumatic motor ..... R. A. Norling  
Pocket knife ..... E. Kaufmann  
Polishing or buffing wheel ..... C. G. Backus  
Post retaining band ..... O. Olson  
Potato dropper and planter ..... F. R. Albright et al  
Pottery. Sagger for baking ..... J. W. Lyons  
Poultry appliance ..... E. J. Shanahan  
Power transmission system ..... R. Williams  
Preserving apparatus ..... T. Widdop  
Press ..... R. B. Campbell  
Printing and issuing machine. Ticket ..... J. P. Eastman et al  
Printing press ..... J. E. Roy  
Printing presses and other machines. Reciprocating bed actuating apparatus for ..... A. Anderson  
Printing. Tapestry yarn ..... B. H. Gledhill  
Propeller wheel ..... A. H. Little  
Propeller wheel. Reversible ..... F. M. Spaulding  
Pulley. Belt ..... D. T. McNiel  
Pulley housing. Sheet metal ..... P. Dosch  
Pulley. Loose ..... R. C. Nugent  
Pump. Compound air ..... H. Wixon  
Pump. Oil ..... L. M. G. Delaunay-Belleville  
Pump. Oil well ..... R. E. Bole  
Pump operating mechanism ..... W. Gobie  
Pump rod equalizing device ..... J. D. Shipman  
Punching and printing system ..... E. C. Albree  
Pushing device ..... L. N. Brouillard  
Rack and pinion mechanism ..... J. C. Hames  
Radiator ..... J. V. Washburne  
Radiator ..... F. Brisco  
Radiator valve union nipple-wrench ..... L. W. Dukerschen et al  
Rail chair and joint combined ..... J. Joynson  
Rail joint ..... J. R. Pring  
Rail joint chair ..... H. H. Crawford  
Railway block signaling. Track instrument for automatic ..... A. J. Stecker  
Railway coupling and draw bar ..... F. W. Parsons  
Railway gate ..... W. M. Lowe  
Railway. Inclined suspended ..... R. B. Fageol  
Railway joint ..... R. B. Swank  
Railway rail holder and tie. Automatically tightening ..... W. H. Brown  
Railway safety device ..... S. A. Gaede  
Railway signal ..... J. E. Adair  
Railway signal apparatus ..... W. H. & S. A. Wilson  
Railway signal. Automatic ..... J. S. Anderson  
Railway signal system ..... R. A. Baldwin et al  
Railway switching mechanism. Electric ..... H. L. Young  
Railway tie ..... J. Freund  
Railways. Electric signaling for trolley ..... E. W. Lee  
Razor blade holder ..... J. H. Hunt  
Razor stropping machine ..... J. Dugmore  
Recuperator ..... R. R. Lade  
Ribbon holder ..... R. A. Gladney  
Rifle sight ..... J. N. Olson  
Rock and ore breaking machine ..... E. H. Sansom  
Rock boring drill. Tubular ..... W. Besson  
Rock crusher ..... J. Y. Byers et al  
Rolling angles ..... E. E. Slick  
Rolling mill ..... E. E. Slick  
Rolling screw nut blanks. Machine for ..... T. M. Anderson et al  
Roofing. Composite ..... G. F. Bishop  
Roofs. Snow guard for ..... J. H. Fulmer  
Rotary engine ..... P. Decor

Rotary engine ..... G. C. Stealey  
Rubber heel for boots and shoes ..... C. Yahraus et al  
Sash balance ..... C. Launer  
Sash center ..... C. J. Caley  
Sash fastener ..... D. G. Saunders, Jr  
Sash fastener ..... F. K. Heupel  
Sash holder ..... A. Tobey  
Sash. Window ..... O. M. Otte  
Saw ..... R. H. Brown et al  
Saw set ..... R. E. Poindexter  
Saw setting machine ..... C. Napier  
Sawing machine ..... J. A. Cumiskey  
Sawing machine. Log ..... D. A. Lunt  
Scales. Scale beam for weighing ..... I. Hirsch  
Scraper. Foot ..... G. F. Hibner  
Screens. Guide strip for sliding ..... H. W. & W. W. Watson  
Segmental rack ..... W. H. Voss  
Semaphore ..... C. H. Williams  
Sewing machine ..... E. F. Durand  
Sewing machine feed ..... W. Duchemin  
Shaft. Flexible ..... J. K. Stewart  
Sharpener. Knife ..... A. L. Davis  
Sharpener. Razor ..... H. P. Fowler  
Shingle machine ..... W. H. Kratsch et al  
Shipping box or crate ..... C. D. Rice  
Shock loader ..... W. Heckart  
Shoe dipping machine ..... J. H. Wall  
Sickles. Water distributor for S. C. Scott et al  
Sieving apparatus. Centrifugal ..... H. L. Orrman  
Signal system ..... J. H. Lynch  
Sill and lintel machine ..... F. A. Borst  
Silo ..... E. F. Schlichter  
Skirt and waist retainer ..... M. E. Clarke  
Slag for production of material similar to trass, &c. Treatment of blast furnace ..... H. Colloseus  
Sled. Steel ..... W. R. Wilson et al  
Sleeve. Emergency knuckle ..... W. R. Taylor  
Sleeve protector ..... C. E. Cather et al  
Sliding extensible screen ..... A. A. Day  
Smoking pipe ..... G. L. Luddin  
Snap hook ..... S. Hoar  
Soldering machine. Vacuum ..... H. Eachus  
Speed indicator ..... R. Hartmann-Kempf  
Spinning and twisting. Cap for cap ..... F. A. Flather  
Spinning frames. Thread board for J. E. Priest Spring ..... G. L. Harvey  
Spring wheel ..... D. Fairard  
Spring wheel ..... W. W. McKee  
Sprocket wheel ..... J. M. Dodge  
Square. Carpenter's ..... D. Polimeni  
Square. T ..... T. Zimmermann  
Stamp. Hand ..... L. K. Scottford  
Stamp. Self inking ..... J. P. Eastman et al  
Steam boiler ..... H. Del Mar  
Steam separator ..... H. H. Humphrey  
Stereopticon apparatus. Automatic ..... M. H. Killen  
Still ..... Z. E. Fiveash  
Stool ..... V. A. Fagerstrom  
Storage battery ..... J. R. Macmillan  
Stove ..... F. D. Moses  
Stoves. Foot rest for ..... W. Reid  
Strainer ..... N. E. Skinner  
Street cleaning machine ..... E. S. Pearson  
Switch point connector ..... W. E. Davis et al  
Table ..... V. A. Fagerstrom  
Tachometer ..... A. C. Butler  
Tag or label ..... M. H. Winn  
Tank ..... A. Hahn  
Telephone apparatus and systems. Privacy device and busy signal for ..... E. A. Reynolds  
Telephone receiver support ..... F. F. Howe  
Telephone receivers. Head band or support for ..... K. M. Turner  
Telephone system. Coin controlled ..... E. A. Reynolds  
Temple roll ..... I. E. Palmer  
Theatrical scenic apparatus ..... G. A. Miller  
Threshing machine straw rack ..... C. E. Whitney  
Ticket holder. Portable ..... J. D. Cantwell  
Tide and wave motor ..... G. W. Hazel  
Tide or wave motor ..... G. W. Hazel  
Tire ..... J. C. Raymond  
Tire and brake. Non slipping ..... J. A. Young  
Tire. Vehicle wheel ..... J. L. Heward  
Tobacco. Machine for loosening cut up ..... J. Wojciechowski  
Toy ..... M. L. Harding et al  
Toy ..... H. E. Coates  
Train reporting system. Automatic intercommunicating ..... E. E. Steiner  
Trap ..... W. E. Werd  
Tray for glasses ..... 2 pats. D. H. Allen  
Tray support ..... F. L. Demartini  
Trolley support and switch ..... B. E. Green  
Trolley wheel ..... M. L. Amann  
Truck ..... P. Twomey  
Truck bolster. Car ..... A. Stucki  
Truck. Brick ..... M. K. Sachs  
Truck. Railway car ..... A. Stucki  
Truck side frame. Railway car ..... A. Stucki  
Trunk ..... J. A. H. Villmow  
Truss for hernia ..... W. H. Washburn  
Tube connection. Pitot ..... J. A. & E. S. Cole  
Tubes. Electrolytic manufacture of metal ..... O. Dieffenbach  
Tunnels. Lowering river ..... P. E. McDonnell, Sr  
Turbine. Steam ..... U. A. Rutledge  
Turn table ..... C. P. Mayer  
Twine holder ..... E. W. Gray  
Twine holder and cutter ..... H. Stolpe  
Type writer and adding machine. Combined ..... A. S. Dennis  
Type writer controlling attachment ..... S. A. Hardman  
Valve and faucet ..... J. Walsh, Jr  
Valve. Balanced throttle ..... N. S. Barr  
Valve for water gas plants ..... J. Williamson  
Valve seat dressing device ..... D. E. Lynam  
Valve seat grinding machine ..... H. Meyners  
Valve. Steam ..... R. Owens et al  
Vehicle ..... J. Loepp  
Vehicle brake ..... W. H. Smith  
Vehicle. Motor driven ..... O. G. A. Littmann  
Vehicle seat suspension. Motor ..... O. Werner  
Vending machine ..... O. K. Sletto  
Vessel propelled by steam ..... E. C. Robinson  
Vessel trimmer ..... J. P. Doyle  
Vessels. Antitorpedo construction for men of war ..... W. A. Dobson  
Veterinary pocket mouth speculum ..... L. McLean  
Voting lever shafts. Friction device for ..... W. M. Delavan et al  
Wagon body protector ..... S. Huffaker

Wagon brake ..... H. Zwilling et al  
Washing machine ..... C. L. Rock  
Water heater ..... D. Shaffer  
Water heater. Domestic ..... W. H. Roberts  
Water heater. Electric ..... F. F. Shipp  
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Water heating apparatus ..... W. S. Whitmore  
Wave motor ..... F. Starr  
Wax holder ..... K. Rohrdantz  
Weather strip ..... T. S. Christie  
Weighing machine ..... E. Cameron  
Well drilling machine ..... J. W. Shawver  
Wheel barrow ..... B. E. Smith  
Whiffletree coupling ..... J. R. Pring  
Whip socket ..... J. M. Clark  
Winder ..... J. W. Harris  
Window screen ..... J. W. Adams  
Window. Sliding ..... W. J. D. Thompson et al  
Wire clamp ..... J. A. Reising  
Wire reeling truck ..... E. H. Jacox  
Wire screen ..... J. M. Stewart  
Wire stretcher ..... G. W. Riker  
Wire working die ..... S. E. Jackson et al  
Wood clip ..... G. F. Martin  
Wood or other material. Decorating ..... E. G. Adames  
Wrench ..... W. H. Zachary  
Wrench ..... H. C. Land  
Wrench ..... H. M. Clark  
Wrench ..... M. J. McGinn  
Wrench ..... W. H. Floto  
Wrench ..... A. Hayes  
Writing or printing with metallic leaf ..... F. S. Hall

## DESIGNS.

Automobile body ..... W. H. Atwood  
Automobile whip socket ..... C. O. Sterling  
Box ..... W. Jones  
Card mount ..... H. A. Stone  
Glass holder ..... J. F. Conlin  
Glass. Sheet ..... W. W. Pilkington  
Illuminator ..... O. A. Mygatt  
Inkstand ..... C. B. Rogers  
Lamp ..... 3 pats. R. M. Dixon  
Lamp holder. Wall ..... F. F. Geraghty  
Spoons or similar articles. Handle of ..... S. J. Large

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Accordion. Mechanically playing ..... A. Zuleger  
Adding machine ..... M. Kun  
Advertising device ..... H. A. de Rudio  
Aerating device for pasteurizing ..... C. Schallinger et al  
Air brake coupling ..... J. S. Farlow  
Air compressor strainer ..... W. J. Ogan  
Air pressure and vacuum indicator ..... H. A. House  
Alkalies and zinc sulfid. Manufacturing caustic ..... C. Ranson  
Amusement apparatus ..... F. H. Dickson  
Anchor. Land. G. D., Jr. R. H. & H. T. Toy  
Anesthetics. Mask for administering ..... A. Rousseau  
Animal trap ..... E. Firnhaber  
Animal trap ..... T. A. Davis  
Arch structure ..... D. B. Luten  
Ax. Folding ..... A. E. Veon  
Axle ..... G. M. Smith  
Axle box cover ..... E. Denegre  
Axle box lubricator ..... 2 pats. A. G. Elvin  
Bag cutting machine ..... S. H. Jones  
Baling hay and similar materials ..... J. & W. H. North  
Baling press ..... J. & W. H. North  
Ball mill. Tubular ..... M. F. Abbe  
Bandages. Device for facilitating the removal of ..... C. P. Williams  
Bar knife ..... W. H. Kingsley  
Basins and the like. Cover and trap for catch ..... P. Hannagan  
Batteries. System of charging storage ..... A. G. Wilson  
Bearing for grinding mills ..... M. Benjamin  
Bearing for rod brasses. Adjustable ..... G. S. Webster  
Bearing. Wheel ..... G. A. Anderson  
Bed attachment. Invalid ..... I. Baker  
Bed. Convertible sofa ..... G. E. Holmes et al  
Bed spring attachment ..... W. A. Perry  
Bed spring fastener ..... R. Naysmith  
Bed spring frame ..... 2 pats. R. Naysmith  
Bed spring support ..... R. Naysmith  
Beds. Weight supporting device for spring ..... C. H. Johnson  
Beehive ..... G. W. Mann  
Beer cooler ..... F. H. Strobel  
Belt reel ..... D. F. Geiger  
Belting. Pressed ..... A. Kislik  
Billiard cue tip fastener ..... G. W. Allen et al  
Boilers. System of water regulation for flash ..... H. Lempp  
Book leaf. Detachable ..... M. G. Swan  
Book. Manifold ..... A. J. Midgard  
Boot tree and last ..... F. Zeisberger et al  
Boring bar ..... J. Riddell  
Bottle attachment. Non refillable ..... E. A. Sullivan  
Bottle attachment. Non refillable ..... E. A. Sullivan et al  
Bottle. Non refillable ..... H. J. Lutz et al  
Bottles, flasks, and the like. Manufacture of ..... P. Wagret  
Bracelet ..... J. M. Clark, 2d  
Brake ..... J. W. Tapp  
Brake hanger ..... C. K. Pickles  
Brake hanger ..... E. H. Scofield  
Brake shoe ..... 2 pats. C. W. Armbrust  
Brake shoes. Making ..... W. D. Sargent  
Breakwater. Floating ..... T. D. Cook  
Brick kiln. Oil burning ..... R. South  
Brick. Manufacture of ..... G. A. Riddle  
Bronzing of printed matter. Device for facilitating the ..... F. Janonshek, Jr  
Brooder ..... W. V. Jacobs  
Broom bridle ..... C. A. Hall  
Brush. Air ..... L. Walkup  
Brush. Bottle washer ..... B. Gohrband  
Brush. Tooth ..... C. R. Stevenson  
Buckle and loop. Wire ..... J. C. Moore  
Buckle hook ..... W. W. Reid  
Buckle. Strap ..... P. H. Burke  
Bung and seal closure for casks ..... H. Gerike  
Burial casket ..... A. Belair

Burning fuel and other materials ..... A. M. Robeson et al  
Burnishing machine ..... F. K. Hatfield  
Bust supporter ..... L. B. Lyon  
Cabinet ..... G. H. Hernecker  
Cabinet. Credit ..... W. M. Ellett et al  
Cables, &c. System for supporting ..... E. Lodder  
Calculating machine. Interest and percentage ..... W. M. Braly  
Camera attachment ..... R. A. Woodall  
Can body machine. Locked seam ..... J. H. McElroy  
Can making machinery ..... J. H. McElroy  
Can opener ..... C. A. Phillips  
Cans. Device for closing the caps or covers on friction top ..... E. D. Murphy  
Candy cutter ..... G. B. Jacobs  
Car couplings. Emergency knuckle for ..... G. H. Gilman et al  
Car. Derrick ..... 2 pats. S. P. Mitchell  
Car draft rigging. Railway ..... J. M. Waugh  
Car dumping device. Automatic ..... W. L. Hansen et al  
Car grain door. Railway ..... E. J. Noblett  
Car seat head rest ..... C. W. Perry  
Car. Spreader ..... P. F. Smith, Jr  
Car step ..... N. A. E. McLendon  
Car underframing ..... H. C. Williamson et al  
Car wheel flange lubricator ..... A. C. Love  
Car wheel. Mine ..... J. J. McCully  
Car windows. Safety lever frame for ..... W. Katzen  
Carbon sheet holder ..... H. W. Hedges  
Carbureter ..... A. S. Comstock  
Carbureter ..... C. Stute  
Carbureter ..... N. J. Verret et al  
Carbureter ..... G. Tresenreuter  
Card holder ..... D. E. Hunter  
Card reproducing machine. Pattern ..... A. D. Moniot  
Carding machine lap feeding device ..... C. Schofield et al  
Carrier ..... V. Filteau  
Cart ..... J. I. Valle  
Cask repairing device ..... J. Majoros  
Casket fastener ..... F. P. Brining  
Caster. Ball ..... C. D. Dunham  
Casting apparatus. Metal. A. C. & T. J. Clark  
Cement blocks and the like. Machine for making ..... W. P. Elmore  
Cement kilns. Operating ..... H. L. Doherty  
Cement, &c. Machine for manufacturing pipes or conduits from ..... C. Girardot  
Cement post ..... L. Christensen  
Cigar machine ..... A. Shedlock  
Cigar machine cutting mechanism ..... A. G. Woodford  
Cigarette and making same ..... N. Du Brul  
Cigarette making machines. Automatically regulated feeding apparatus for ..... R. A. Sloan et al  
Circuit breaker. High tension ..... R. H. Read  
Cisterns and tanks. Mosquito guard for ..... B. C. Mire  
Chain machine splitter bit ..... T. S. Hardesty  
Chair and couch. Combined ..... C. S. Stevens  
Chenille bindings or trimmings. Machine for making ..... E. P. Eversmann  
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Clamping device ..... A. E. Brown et al  
Clay. Treating ..... E. S. Powers  
Clays containing gypsum. Treating ..... K. Sakurai  
Cleaning and polishing device ..... W. J. H. Hamea  
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Clock. Electric ..... G. H. Andrews  
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 Boxing purposes. Presser machine for.....  
 G. N. Pond  
 Brake..... W. G. Price  
 Branding tool..... M. P. Sullivan  
 Brick mold..... J. A. Judie  
 Bridle bit..... G. M. Peters  
 Brooder..... L. W. Clark  
 Broom rake..... N. Doit  
 Brush..... W. E. Whittemore  
 Brush..... O. Fish  
 Brush..... R. Kulenkampff  
 Brush Fountain..... J. Cadden et al  
 Bucket. Dumping..... C. J. Close  
 Bucket operating mechanism. Clam shell.....  
 F. E. Hulett  
 Buckle. Line and rein..... F. M. Kibbey  
 Buckle. Trace..... O. Rampendahl  
 Buckle. Trace..... E. L. Goodrich  
 Buggy bow spring attachment..... G. A. Johnson  
 Building block..... N. J. Peterson  
 Burlap caskets, coffins and the like. Handle  
 for..... C. Blesch  
 Butter cutter..... C. F. Fogg  
 Butter cutting machine..... E. J. Luhman  
 Button..... E. A. Smith  
 Button. Collar and cuff..... J. K. & J. G. D. Thoma  
 Cable grip. Aerial tramway..... 2 pats  
 E. P. Frederick  
 Calendar. Perpetual..... W. B. Summerall  
 Camera attachment..... W. E. Phillips  
 Can heading machine..... B. Adriance et al  
 Can making machine..... B. Adriance et al  
 Case loading apparatus..... L. J. B. Truand  
 Cannon recoil mechanism..... F. B. Yingling  
 Car brake. Motor..... R. Bugge  
 Car. Brick..... 2 pats..... F. H. Reid  
 Car coupling..... A. Schulz  
 Car guard rail. Street..... E. P. Dandridge  
 Car journal box. Railway..... J. R. Williamson  
 Car lever..... G. B. Sullivan  
 Car. Railway..... H. L. Kerr  
 Car register..... F. A. Schierberg  
 Car. Sleeping..... P. P. Carroll  
 Car wheel..... A. Mast  
 Carbueter..... L. Renault  
 Carpenter's tool..... W. C. Hause et al  
 Carpet sweeper..... W. H. Emmert  
 Carriage. Folding baby..... A. B. Todd  
 Cart. Road..... E. P. Hollister  
 Caster..... O. Hoffmann  
 Casting machine..... E. E. Waite  
 Casting mold..... J. M. Dodge  
 Cattle guard..... F. V. Grimes  
 Chain. Detachable drive..... L. R. Rogers  
 Channelling machine..... W. Prellwitz  
 Charging or feeding device..... W. H. Blauvelt  
 Check back attachment and clamp for teams.....  
 T. Schmeiser  
 Cheese cutter..... R. D. Drummond  
 Chuck. Drill..... G. R. Rich  
 Chuck. Rock drill..... J. S. Harris et al  
 Churn..... Z. L. Harbin  
 Chute. Adjustable stock..... A. E. Starrett  
 Cider mill..... E. R. Goings  
 Cigar bands or labels. Book, diary, album, &c.  
 for the preservation of..... J. Hill  
 Cigar bunches. Device for the preliminary  
 forming of..... G. J. Prentice  
 Clamp bracket..... E. A. Litts  
 Clipper. Hair..... T. W. McNally  
 Cloth pressing machine..... J. Ecker  
 Clothes pin..... C. W. Boese  
 Clutch..... R. S. Kasson  
 Coal cutting machine..... A. H. Gibson  
 Coal finding instrument..... L. B. Mognett  
 Coke ovens. Drawing machine for.....  
 R. D. Martin  
 Collar and cuff shaper..... G. L. Richardson  
 Collar. Horse..... G. W. Hahn  
 Collar stay..... L. C. Collins  
 Color applying apparatus. Pneumatic.....  
 F. Wolf  
 Combing machine gill box, &c. Wool.....  
 S. Ormondroyd et al  
 Combination lock..... D. H. Cleveland  
 Commode..... W. C. Freely  
 Concrete dam. Laminated multiple arch.....  
 S. P. Brown  
 Concrete mixer..... C. R. Weaver  
 Concrete. Sectional girder and column of rein-  
 forced..... R. Grimm  
 Contact. Shoe..... G. H. Fretts  
 Copy holder..... W. P. Swope

Copy holder. Rotary..... W. P. Swope  
 Core vent and support. Combined metal.....  
 H. C. Caldwell  
 Corn cutting machine..... C. A. Young  
 Corn huskers and shredders. Feeder for.....  
 E. F. Nash  
 Cotton chopper..... A. Jezek  
 Counter..... H. T. Weston  
 Counter shaft mechanism. Variable speed.....  
 J. E. Hunter  
 Crate..... O. J. La Bauve  
 Crown and bridge work..... A. H. Brown  
 Crushers and pulverizers. Dumping cage for.....  
 M. F. Williams  
 Cuff holder..... S. P. Dunlap  
 Culinary utensil..... F. J. Larock  
 Cultivator..... I. N. Van Pelt  
 Cultivator..... R. T. Love  
 Cultivator and planter..... D. W. Strickland  
 Cultivator attachment..... D. W. Strickland  
 Curbing and sidewalk dressing implement.....  
 P. E. Connelly  
 Current distribution. Safety device for alter-  
 nating..... G. N. Eastman  
 Curved surfaces. Attachment for shapers for  
 making..... H. Dunn  
 Cutting mechanism..... C. F. Smith  
 Cycle. Motor..... E. Butikofer  
 Damper. Bolster swing..... W. G. Price  
 Derrick. Portable..... J. F. White  
 Desk. Adjustable combination..... C. S. Owens  
 Dial. Illuminated..... C. F. Fernald  
 Disk drier..... J. Daly  
 Dish washing machine..... I. L. Frankem  
 Dish jointer..... T. M. Ross  
 Display case. Portable..... J. W. Shaw  
 Display rack. Extensible..... E. L. Reichle  
 Distilling apparatus..... L. Kleitz  
 Dolls. Articulation of..... H. W. Meier  
 Door check..... B. Gonyo  
 Door check and closer. Combined.....  
 A. F. Bardwell  
 Door Grain..... W. J. Cocklin  
 Door hanger..... W. P. Benson  
 Door securer..... J. R. Hall  
 Draft equalizer..... S. E. Bailor et al  
 Drawing press..... B. Adriance et al  
 Dresser..... W. K. Malcolm  
 Drier..... C. A. Matcham  
 Dye and making same. Anthracene.....  
 O. Bally et al  
 Dye and making same. Sulfur..... A. Schmidt  
 Dye and making same. Yellow..... F. Scholl  
 Egg beater..... T. H. Perrin  
 Electric circuit controller..... H. W. Leonard  
 Electric light. Portable..... C. Hubert  
 Electrical effluvia. Apparatus for indicating  
 the character of..... L. Gerard  
 Electrical switch and cut out..... C. M. Dorman et al  
 Electropneumatic channeler..... A. H. Gibson  
 Engine frame. Locomotive..... C. H. Howard  
 Engine sparking ignition controlling means.....  
 Explosive..... J. S. Moreland  
 Engines. Means for cooling internal combustion.....  
 F. H. Bogart  
 Engines. Submerged exhaust device for marine.....  
 H. N. Goodwin  
 Engraving machines. Holder or quill for hold-  
 ing the rotating tools of..... M. Barr  
 Envelop and message blank. Combination.....  
 W. H. Bassinger  
 Envelop stacker..... R. H. Strong  
 Excavating machine..... J. B. Gordon  
 Exhaust. Automatic..... W. Cooper  
 Explosives. Completely exploding high.....  
 H. von Dahmen  
 Exposure appliance..... A. Leistenschneider  
 Eyeglasses..... J. C. Wells  
 Fabrics. Machine for extracting threads from.....  
 H. C. Fischer  
 Fan..... C. F. Finch  
 Fare register..... A. H. Woodward  
 Feed device. Relative..... F. I. du Pont  
 Feed water regulator..... H. W. Adams  
 Feeding device..... E. N. Trump  
 Fence..... J. W. Veit  
 Fence post..... T. Eck et al  
 Fence. Wire..... A. E. Roberts  
 Fender..... J. Stawartz  
 Fifth wheel..... H. S. Rader et al  
 File. Bill..... P. T. Lemaster  
 Filter..... L. W. Jones  
 Filter..... M. L. S. & W. T. Buckner  
 Filtering plate..... G. W. Gerlach  
 Fire boat..... L. Nixon  
 Fire escape..... C. F. Davy  
 Fire extinguishing apparatus..... C. E. Buell  
 Fire pot. Adjustable..... C. H. Gatchell  
 Firearm..... J. H. Wesson  
 Firearm..... J. M. Browning  
 Firearm. Breech loading..... O. F. Mossberg  
 Firearm. Magazine..... V. M. Sprangel  
 Firearm. Magazine..... H. W. De Jarnatt  
 Fireproof metal window frame and sash.....  
 S. Keighley  
 Fireworks..... W. A. Gilmer  
 Fish plate..... G. H. Cornwell  
 Fishing reel..... W. Ernst et al  
 Fluid pressure brake..... W. P. A. Macfarlane  
 Fly trap..... B. Lenthier et al  
 Forceps for handling boiled clothes.....  
 L. W. Price  
 Foundry molds. Machine for manipulating.....  
 P. Bonvillain  
 Fruit clipper..... H. H. Petty  
 Fruit drier..... M. Rodgers  
 Fruit packing device..... F. K. Bartholomew  
 Fuel feeding apparatus. Pulverized.....  
 G. S. Welles  
 Furnace..... H. Webster  
 Furnace charging apparatus. Blast.....  
 J. W. Dougherty  
 Furnace grate bar..... T. E. Martin  
 Fuse. Shell..... W. H. Driggs  
 Game..... A. Bolton  
 Game apparatus..... E. Kuhn  
 Game apparatus..... A. M. Benedict  
 Game board..... S. M. Thomas  
 Game counter..... O. W. Field  
 Garment..... F. A. Platz  
 Garment hanger..... S. N. Cragin  
 Gas burner..... G. Machlet, Jr  
 Gas purifier..... E. C. Jones et al  
 Gas saving device..... F. W. Playsted  
 Gate construction..... L. F. Hake  
 Gear. Slide..... H. H. Buffam  
 Gearing. Variable speed friction..... E. P. Cowles  
 Glass blower's dummy..... P. J. O'Brien

Glass securing device. Plate..... H. R. Ransom  
 Gold saving apparatus..... I. P. Lambing  
 Goods handler..... W. R. Calvert  
 Governor. Electromagnetic..... D. Bacon  
 Governor. Engine..... C. N. Walsh et al  
 Governor. Spring motor..... W. B. Kirby  
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 Grain cleaner..... A. W. Eaches  
 Grain dump and elevator..... C. S. Upham  
 Grasper. Automatic..... K. Bottcher et al  
 Grate..... J. E. Frost  
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 Gun mount..... L. L. Driggs  
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 K. Voller  
 Guns. Telescopic sight for..... J. F. Meigs et al  
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 Hammer drill..... W. Prellwitz  
 Hammer Electric..... W. F. Wegner  
 Hand bag..... J. D. Wood  
 Hand press..... J. Spengler  
 Harness..... E. H. Yule  
 Harvester. Beet..... L. Stinart  
 Hasp..... J. C. Griffin  
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 therefor..... F. L. Butterworth  
 Hat fastener..... R. Willis  
 Hat hanger..... P. F. Denning  
 Hat hanger..... M. W. Potter  
 Hat pin..... A. Woodward  
 Hat pin..... E. Rating  
 Hay rack..... J. Dain  
 Hay rake..... H. R. Ingledue  
 Heat conserving apparatus..... H. Lang  
 Heat resisting fabric..... G. F. Cole  
 Hobby horse. Progressing..... A. Hitt  
 Hoisting apparatus safety device..... J. Dahlin  
 Hook and eye..... H. A. Aldred  
 Hook for cutting corn, &c..... B. F. Bean  
 Horse drenching device..... N. S. Price  
 Horseshoe. Elastic tread..... A. W. Jones  
 Hose rack. Swinging..... R. D. Wirt  
 Hose reel..... R. D. Wirt et al  
 Hose supporter..... L. W. Green  
 Hot water heater..... C. M. Clausen  
 Hundred indicator..... A. H. Woodward  
 Hydrant..... W. S. Phelps  
 Ice creeper..... C. O. Cook  
 Implement. Combination..... W. L. Iwan  
 Ingot mold..... H. Grey  
 Injector. Steam..... W. A. Downes  
 Ink well..... F. M. Ashley  
 Ink well..... W. P. Swope  
 Inking pad..... A. C. Jackson  
 Iron and its alloys. Manufacturing.....  
 M. Ruthenburg  
 Iron heater..... C. Petty  
 Ironing machine..... H. Wonderlich  
 Jar closure..... F. O'Neill  
 Jars and other like articles. Holder for.....  
 P. E. Perry  
 Joist hanger or stirrup..... F. L. Hughes  
 Journal box..... G. W. Meyer  
 Journal box. Ribbed..... J. S. Patten  
 Kettle..... R. & J. A. Medley  
 Knitting machine thread feeding device. Ci-  
 clular..... E. I. O'Neill et al  
 Knob fastening..... F. J. Schwarz  
 Labeling machine..... F. O. Woodland  
 Lacing..... S. C. Abramson  
 Lamp bulbs. Blowing off the necks of.....  
 E. L. Elliott  
 Lamp. Electric incandescent..... O. Feuerlein  
 Lamp. Gas..... 2 pats..... F. A. Ray  
 Lamp. Miner's..... T. T. Carter et al  
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 Lamps, &c. Plug socket for electric.....  
 F. J. Russell  
 Last..... G. E. Belcher  
 Lasting and sewing machine for boots and  
 shoes..... J. Keats  
 Lathe dog..... A. Krus  
 Lawn edge trimmer and ditcher..... J. M. Aldrich  
 Lawn trimmer..... H. B. Pitner  
 Leach pitcher..... J. C. Dunn  
 Ledger. Loose leaf..... F. Bollenbach  
 Lifting jack..... W. J. Gray  
 Liquid meter..... K. Scotti  
 Liquors. Apparatus for the manufacture of  
 bisulfite..... E. R. Barker  
 Lock..... B. Phelps  
 Locking device..... G. Holden  
 Locomotive roundhouses. Hood and smoke  
 pipe for..... E. S. Piper  
 Loom harness controlling mechanism.....  
 P. Cassidy et al  
 Machinery. Folding..... E. H. Cottrell  
 Mail bag catcher..... W. T. & E. B. Whitesell  
 Mail bag catching and delivering mechanism.....  
 W. T. Rook  
 Massage apparatus..... G. B. Fraley  
 Mattress stretcher. Wire..... J. B. Wilson  
 Measuring and delivering liquids. Apparatus  
 for..... G. L. Spencer  
 Measuring and registering device. Combined.....  
 J. Barry et al  
 Measuring instrument..... V. J. O'Connor  
 Measuring vessel..... C. Schock  
 Mechanical motor and brake..... A. W. Bartlett  
 Metal beams or girders. Machine for cutting  
 up or mitering flanged..... J. Kruger  
 Metal bending machine..... D. M. Baxter  
 Metallic leaf. Package roll of..... W. H. Coe  
 Mines, &c. Device for searching submarine.....  
 U. S. Sjostrand  
 Mop head and wringer. Combined.....  
 W. R. Wiley  
 Mop wringer..... T. J. Putnam  
 Mop wringer..... W. H. Wetmore  
 Mosquito net..... J. W. Graeme  
 Motor regulator. Gas and petroleum.....  
 H. Clouan  
 Music leaf turning stand..... J. & J. C. Bahl  
 Nail receptacle..... M. A. Salmon  
 Necktie frame..... T. J. Lumis  
 Noodle cutter..... W. N. Foust  
 Nut. Lock..... E. W. Treatt  
 Nut. Lock..... H. Steinert et al  
 Nut lock..... W. McCane  
 Nut lock..... C. E. Palmer  
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 Obstetrical instrument..... J. G. Gottlieb  
 Oil saver..... J. T. Callanan  
 Oil separator..... C. H. Gameson  
 Opera chair hat and wrap rack.....  
 F. D. Laterman  
 Ordnance. Breech loading..... R. G. Dashiell  
 Organ and piano..... F. M. Howard  
 Oven..... H. C. G. Kreutzkamp

Ovens. Apparatus for feeding articles into.....  
 W. Stender  
 Packing. Piston rod..... E. Bader  
 Packing. Rod..... O. J. Garlock  
 Paddle wheel. Feathering blade..... J. A. Hicks  
 Paper..... J. A. Wilkinson  
 Paper making apparatus..... P. Couper  
 Pen. Fountain..... O. E. Weidlich  
 Pencil holder..... A. R. Eldredge  
 Pencil sharpener..... P. Garst  
 Perch support..... F. E. Heierding  
 Photolithography and the like. Half-tone.....  
 A. Stophan  
 Piano..... J. A. Weser  
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 P. Krumschield  
 Pianos. Repetition action for..... J. Schaaf  
 Pipe and like clamp..... P. Sheridan  
 Piling. Metal sheet..... J. R. Williams  
 Pipe..... 2 pats..... C. Elkin  
 Pipe or tile cutting machine..... R. L. Heafer  
 Pipe puller..... J. W. Walker  
 Pipe wrench..... C. L. Dunham  
 Pipe wrench..... A. Meffert  
 Pipe wrench. Automatic adjustable grip.....  
 W. H. Dalby  
 Piston. Horizontal cylinder..... F. L. Bates  
 Placket clasp..... S. M. Fischer  
 Plane..... H. B. Sargent  
 Planter..... J. M. Taylor  
 Planter. Combined potato and corn.....  
 W. A. Hall, Sr  
 Planter. Corn..... J. N. Frame  
 Plastic block machine..... G. W. Crichtfield  
 Plate shears..... C. Swan  
 Plow..... F. L. Woodward  
 Plow. Motor..... A. J. Holland  
 Pneumatic carrier indicator..... H. W. Rottel  
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 Power by electric currents. Transmitting.....  
 W. Stanley  
 Power generating device..... D. C. Tubbs  
 Power mechanism..... B. J. Arnold  
 Preserving organic matter..... W. T. Scheele  
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 J. A. Loyster  
 Printing in colors. Stencil plate for.....  
 G. Courtot  
 Printing press sheet manipulating mechanism.....  
 L. E. Morrison  
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 L. E. Morrison  
 Printing surfaces. Producing..... H. Barth  
 Propelling device..... O. F. Hagaman  
 Pump. Duplex..... P. F. Oddie  
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 Pump piston attachment..... J. McEwen  
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 matically controlling the operation of beer or  
 other..... A. C. Griscom  
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 I. Flowers  
 Punch. Hand..... T. F. Philippi  
 Punching bag support..... R. E. Bied  
 Pyrometer. Portable hot blast..... E. Brown  
 Rail joint..... E. Willows  
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 Railway frog..... H. & H. J. Theis  
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 Railway signaling device..... C. H. Smith  
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 Railway switch..... 2 pats..... C. B. Brinker  
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 A. K. Warren  
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 Railways. Continuous rail crossing for street.....  
 O. Gottschalk  
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 Recording apparatus..... A. M. Benedict  
 Refining engine..... S. R. Waggoner  
 Regulator or governor..... J. W. Boyle  
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 Resawing machine..... J. C. Lawhon et al  
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 R. C. Grossmann  
 Roads or other places. Compound which forms  
 an emulsion with water to be applied to sur-  
 faces of..... E. Hardcastle  
 Rock drill..... A. H. Gibson  
 Roofing and siding material..... reissue.....  
 F. D. Jacobs  
 Rotary engine..... J. F. Eynon  
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 Safety pin..... W. W. Brown  
 Saliva ejector..... H. S. Davis  
 Sand blast apparatus..... J. D. Murray  
 Sash holder and lock..... A. J. McCord  
 Sash. Window..... J. B. McKewen  
 Saw file..... P. Lord  
 Saw guard. Circular..... H. D. Melendy  
 Scaffold bracket..... R. E. Irwin  
 Scale. Traveling hopper..... F. J. Wolff  
 Scarf ring..... T. F. Dunn  
 Seal for envelopes..... F. Corrigan  
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 O. Heindorf  
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 A. L. Madison  
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 R. Lyons  
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 W. H. Burden  
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 G. Holden  
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Signal ..... M. D. Campbell  
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Skylight construction ..... J. Haslam  
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Sole pressing machine 2 pats ..... E. E. Winkley  
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Stalk cutter ..... W. P. Dorris  
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Strap hanger, signal bell ringer and register ringer. Combined ..... S. S. Brooks  
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Switch operating and locking mechanism ..... A. Anderson  
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Table ..... S. A. Nichols  
Table ..... L. C. Bullock, Jr  
Tackle block ..... H. V. Hartz  
Tag. Laundry ..... H. Higgin  
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Telephone ..... S. P. Levenberg  
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Telephone. Extension arm ..... T. J. Skelley  
Telephone signal ..... A. V. R. Fechtenburg  
Telephone system ..... R. H. Manson  
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Telephone trunking system ..... W. W. Dean  
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Telescope ..... E. A. Trapp  
Telescope and means for mounting the same ..... E. A. Trapp  
Telescope dust cap and solar eyepiece ..... F. B. Warner  
Temperature regulator ..... C. Bargamin  
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Tumbler lock ..... N. W. Webb  
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Type writing machine ..... A. W. Smith  
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Valve ..... F. Schreidt  
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Valve mechanism for gas engines ..... J. J. Healy  
Valve operating device for compressors ..... H. J. Smith  
Valve. Piston ..... H. C. Sergeant  
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Valves. Shifting eccentric for engine ..... P. Dumbolton  
Vehicle body ..... C. G. Bennett  
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Wrapping machine ..... A. Stearns et al  
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## DESIGNS.

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Canadian Patents may now be obtained by the inventors for any of the mechanical inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated, the cost will be a little more. For full instructions address Inventive Age Publishing Co., 918 F Street N. W., Washington, D. C.

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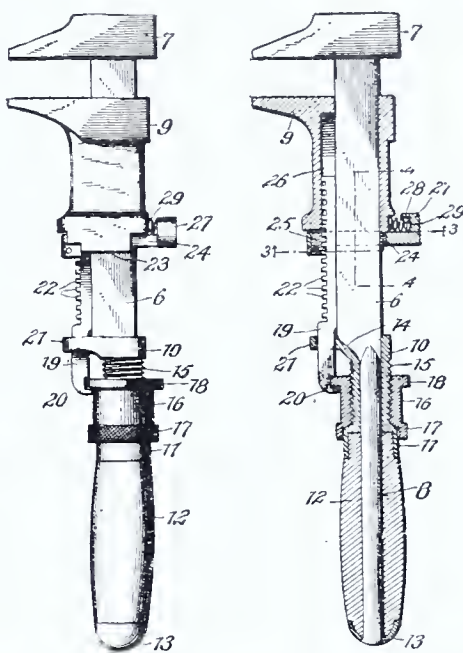
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## VALUABLE PATENT FOR SALE.

There are innumerable types of wrenches on the market, but Mr. Ignatz Weisnek, of Burdine, Pa., now offers for sale a patent on a wrench, having improved features, that will at once commend it to all users of these tools.

Briefly stated, he has secured a patent on a wrench that has both a quick action adjustment, and a minute adjustment. In other words, the wrench is so arranged that the movable jaw can be slipped from one end of the shank to the other without the necessity of employing any adjusting screws or the like, and afterwards, when the general adjustment has been obtained, the movable jaw can be accurately adjusted to properly fit the wrench to the object to be operated upon.

The structure of the wrench will be readily comprehended from the accompanying illustrations of the same, one of which is a side view, and the other is a longitudinal section. A shank 6 is employed, having at one end a stationary jaw 7, and at the other end a suitable handle 12. A sleeve 10 is fitted on one end of the shank, and threaded on the sleeve is an adjusting nut 16. This adjusting nut has an out-



standing flange 18, which slidably engages a rack bar 19, having teeth 22. A jaw 9 is slidably upon the shank 6, and coacts with the stationary jaw 7. On one end of this jaw is slidably mounted in a novel manner, a yoke 24, one end of which has a thumb piece 27, the other end having teeth 25 that interfit with the teeth 22 of the rack bar, being yieldingly held in inter-fitting relation by a coiled spring 28.

In adjusting the sliding jaw 9, if there is to be a considerable movement of the same, the thumb piece 27 of the yoke is pressed so that the teeth 25 carried by the yoke will be disengaged from the teeth 22 of the rack bar, whereupon the jaw can be slipped to substantially the position desired. Then, if a finer adjustment is necessary, the nut 16 is rotated in one direction or the other, and consequently the rack bar 19 will be moved longitudinally of the stock or shank, carrying the sliding jaw with it. In this structure, it will be apparent that the parts are simple, that a quick action and fine adjustment can both be obtained, and that said parts can be

readily separated and assembled and are not liable to derangement.

As already stated, the patent covering this wrench is now offered for sale by Mr. Weisnek, and it is believed the one who secures it will obtain a valuable invention. Any one who may be interested will be furnished with fuller details as to the wrench, together with the terms of sale, by addressing Mr. Ignatz Weisnek, Burdine, Pa.

## Aid to Navigation.

The telemobiloskop is the jaw-breaking name given to a device which is attracting attention in maritime circles. It is designed to enable the pilot of a ship, in foggy weather, to discover the nearness of another vessel, even if the pilot of the other boat fails to give signals by which he could make himself heard. The apparatus works automatically, so that after it is once adjusted, nothing needs to be done until a ship is discovered by it, when, by an unimportant manual action, the location of the other boat can be disclosed.

The invention is based on the principle that electric waves, such as are used by wireless telegraphy, are reflected the moment they strike metallic objects in their course. An axle is therefore provided, so hung as always to maintain a vertical position. Around this axle turns a large projecting box, from which electric waves are sent to the surface of the ocean in all directions. Lenses serve to make these waves travel compactly in a body. If the waves strike a ship, a reflex will bring them back to a receiver, similar to those used for wireless telegraphy. A metal plate between the receiver and the box so separates the waves that only those returning can strike the receiver. The device at once indicates when a ship is near, and locates it.

## Successful Rabbit Trap.

Consul-General Bray reports from Melbourne that a new rabbit trap is being used in Australia with great success, whereby rabbits may be caught alive in very large numbers. It is used in connection with small trap yards, diagrams for the construction of which are supplied by the patentee of the traps. The trap itself is 18 inches long, 12 inches high, and 6 in width. It has a balanced moving floor and a door at each end, which opens and closes automatically. The weight of a rabbit on the inverse end of the floor closes the door behind him by which he has entered, and opens the door in front leading to the trap yard, so that the rabbit has no option but to go on, and when he leaves the trap, it goes back to its former position, thus resetting itself. The small trap yards are constructed of double-wire netting fences, in the spaces between which green fodder or hay is cultivated or provided, and, although these foods can not be reached by the rabbits, it entices them to enter through the traps to try and get at the fodder from the other side. Two, three, or more traps may be used in connection with each trap yard. The invention has been tried with great success on several extensive ranches in Australia, and the inventor has a number of certificates from leading ranchmen, one of whom states that with two of the traps set at a small water hole he caught 630 in one night.



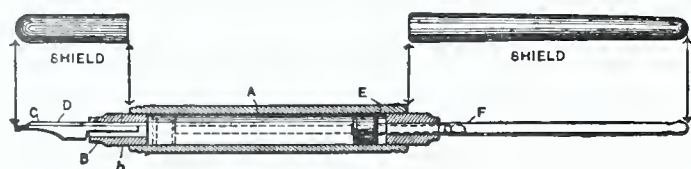
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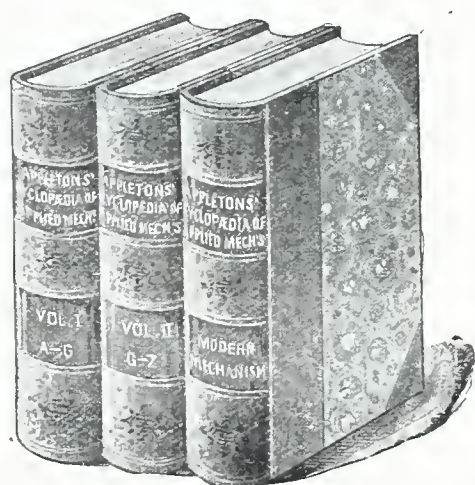
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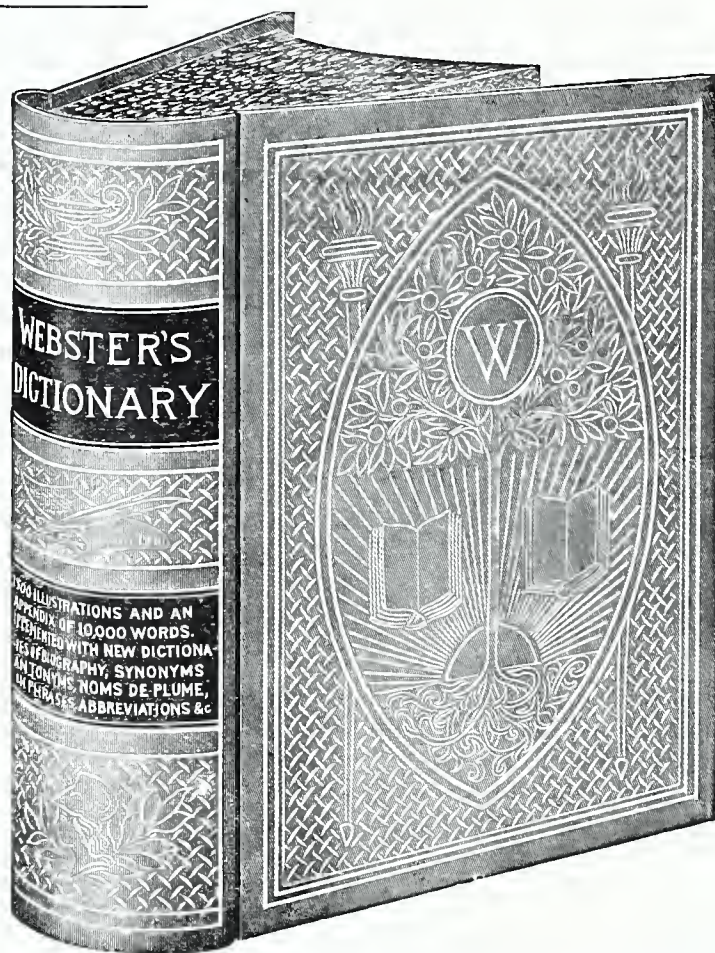
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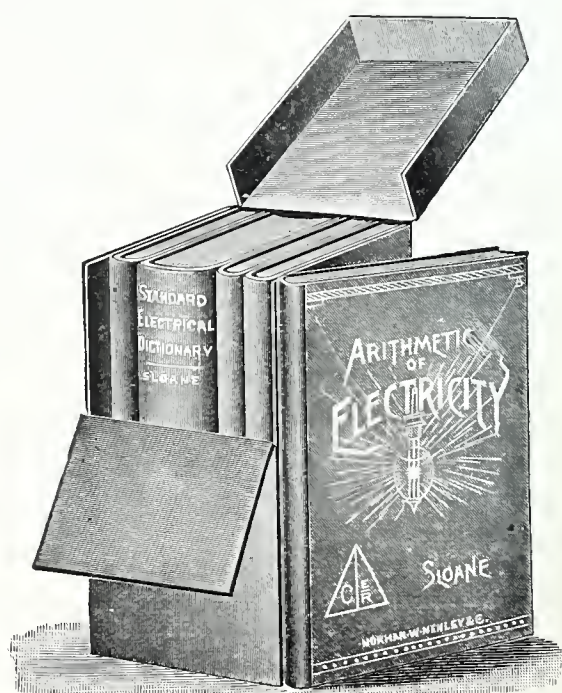
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## IN CALIFORNIA'S FOREST OF GIANTS.

By CHARLES ALMA BYERS.

THE West of our country contains many surprises. Nature has graciously lavished upon it a surpassing number of her wonders. It possesses natural curiosities and attractions galore. And barring the possible exception of the Grand Canyon of Arizona, among the immense collection none is deserving of more notice than California's forest of giants.

The "big tree groves" of California, as they are commonly referred to, have been often written about, and there are perhaps few persons in the

subject for a picture that is indeed difficult for the imagination to paint. Incredulity in this case is almost excusable. Victor Hugo, in his "Toilers of the Sea," causes M. Lethierry to tell Derwehette of these wonderful trees, saying that a horseman might ride 150 paces into a hollow trunk of one of the prostrated giants. The story of course sounded unreasonable, like a tale from "Arabian Nights," and is generally considered by the reader as having been told for no other purpose than to amuse. A visit to this forest,

Mariposa Grove. Each of the divisions is reached by stage drives of various distances from the Santa Fe and the Southern Pacific railroads.

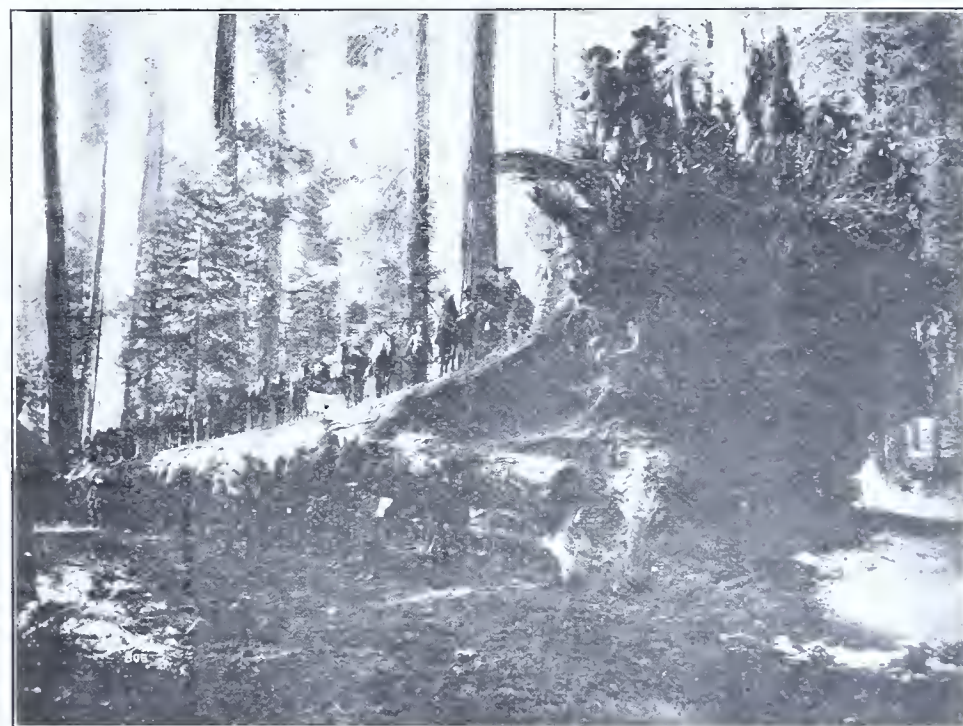
The scientific name of the trees is *Sequoia*, and the group of groves is often referred to as the Sequoia Forest. This name is said to be derived from Sequoyah, the name of a Cherokee Indian. To the hunter in pursuit of a wounded bear, in the early spring of 1853, is given the credit of first discovering this wonderful forest. His story of the discovery,

Cruz. The *gigantea* variety, which is the head of the Sequoia family in age and size, is found only on the western slope of the Sierra Nevada, usually at an elevation of from 4,000 to 6,500 feet. Of this variety there are specimens which tower into the sky 400 feet, and one is said to slightly exceed this, while in circumference a large number of these giants measure from seventy to one hundred feet.

Unlike the Eucalyptus of Australia, these trees are proportionate and symmetrical in girth and height, and not



WAWONA SHOWING TUNNEL.



TROOP F ON THE FALLEN MONARCH.

United States who have not heard of their existence. Nevertheless, since new trees and new wonders are being continually added to the forest, the subject is still interesting, and will long continue so. Then, too, there is always the battle against skepticism to be waged. Those who have not visited the forest imagine the descriptions thereof to be greatly exaggerated. Trees over a hundred feet in circumference, three and four hundred feet in height, thousands of years old, and still living and growing, make a

however, leads to the formation of a different impression, and to a full realization of the forest's unquestionable attractiveness.

This forest of giants is divided into six recognized divisions. The most widely known and the one most often visited is the Mariposa Grove, which is located about 250 miles west of San Francisco, on the stage route to the Yosemite Valley. The other groves, known as the Santa Cruz, the Big Basin, the Calaveras, the Tuolumne and the Fresno, center around the

however, was laughed at, and several years passed before the existence of the forest became generally known.

There are two varieties of these trees, the *Sequoia gigantea* and the *Sequoia sempervirens*. The latter is the famous redwood of commerce, and the groves in which it grows are usually found on the ocean side of the Coast Range mountains. It has attained the height of 275 feet in a few instances, and a diameter of 22 feet. It is a very valuable timber, and immense quantities of it are found in the grove at Santa

mere poles or slender shafts reaching skyward. Both varieties are evergreens, and some of the giants have limbs that leave the parent trunk at an elevation of over one hundred feet which measure six feet in diameter—broad and strong enough to support a stage coach. Both trees also bear small cones, two or three inches long, containing little flat seeds, very similar to parsnip seed. The wood of the trees, reddish in color, is very solid, and the most of the giants, despite their immense size and age, on being



cut down, are found to be solid and undecayed to the core.

The age of the "Big Trees," or Wawonas, as the Indians call them, can only be conjectured. There has been much controversy between scientists upon the subject, but no agreement has ever been reached. The estimates made vary from the beginning of the Christian era to a period ante dating the Christian era by 4000 years. Professor David Starr Jordan, president of the Leland Stanford University of California, who has often visited the forest and is considered a high authority upon the subject, says that some of the largest trees may be 7000 years old. A peculiar feature in connection with their age is that they seem to be endowed with everlasting life, unless killed by an external force. No tree has ever been found to die from age. Unless cut to the ground by the woodman's axe, or uprooted by some tremendous storm, they live and grow on from century to century. They seem to possess the sap of perpetual life, and it is to be wondered at that the herb and medico fakers have never taken advantage of the opportunity to advertise a compound from this source that would give to man the same enduring qualities. And could not Haggard's story of the immortal "She" have been made to sound more plausible had he had her bathe in the sap of Sequoia, instead of in his volcanic fire?

Many of the trees of the forest have

been given names, and in order to convey a better understanding of the immense sizes of tree growths to be found here, it may be well to refer to some of the giants by these names. "The Grizzly Giant" is the most noted tree of the forest. At five feet from the ground it measures 90 feet in circumference and 30 feet through. Eleven horses standing side by side form a line no larger than the diameter of the tree, and at 125 feet from the base there is a branch six feet in diameter.

"Wawona" is another tree that measures 30 feet in diameter. It stands on the stage route to the Yosemite Valley from Merced, and a tunneled roadway, 10 feet wide and 12 feet high, has been cut through its trunk. This forms room for vehicles to pass side by side in the tunnel; and still the tree is growing and putting forth new leaves each year. It is one of the curiosities of the forest.

"The Fallen Monarch" is a giant which some severe storm has uprooted and prostrated upon the ground. It is also of immense size, and some one has computed its lumber to be sufficient "to plank the three miles of Broadway, New York, from the Battery to Madison Square." Stage coaches have often been driven along on the top of the prostrated trunk, and a company of cavalymen can almost find standing room on the upturned side.

All of these trees are found in Mariposa division. The king of the forest,



THE GRIZZLY GIANT IN MARIPOSA GROVE.



THE GRIZZLY GIANT.

however, is found in the Fresno Grove, or the General Grant National Park, on Mount Rob Roy, high up in the Sierra Nevada mountains. It was first found during the summer of 1902. It is the largest of its specie, being 100 feet in circumference and 400 feet high, and is still growing. It contains over 3,000,000 feet of solid lumber alone. There is a huge fallen tree in the same section which some mathematician has declared contains timber enough to make 440,000 rails 10 feet long and 3 inches thick, and which at the rate of 150 a day of ten hours, would have kept Abe Lincoln busy splitting for nine years and three months.

There are many other such giants, and statistics connected therewith, of an almost incredible nature, which might be mentioned, but these will serve as an illustration. No where else on the globe are found trees of such enormous size. Even the bark of these giants equals in thickness the diameter of a tree of fair size. The bark of a Sequoia varies in thickness from eleven to forty inches. It is a bright cinnamon color, perpendicular, soft and very fibrous.

#### Australian Trade Mark Law.

The trade-marks act which was recently passed by the Federal legislature of Australia, is of much importance to traders throughout the world. The owners of existing trade-marks registered in any one or more of the States of Australia retain their full rights, but the registration of such a trade-mark will cease at the end of fourteen years, or at the time when a fee for the continuance of its registration would be needed, whichever happens first; but the proprietor of such a State trade-mark may apply for its registration at any time under

the Commonwealth trade-marks act, which will extend his rights to the whole of Australia; and if he fails to apply at once the mark may be acquired in other States by some one else. When registered under the Commonwealth, the official examiner will do the watching to prevent other parties from registering that mark.

#### Some Erring Prophets.

It occasionally happens that the predictions and theories of mathematicians and scientists are woefully upset and contradicted by actual results. Every one is familiar with the story of the editor who, in the days of Stephenson's early experiments in railroading, predicted that a speed of more than twelve miles an hour by rail would be impracticable if for no other reason than that the human system would not withstand traveling at a higher rate of speed. In the early days of steam navigation also, Dr. Lardner delivered an address before a scientific body, in which he maintained that transatlantic steam navigation was impracticable, mainly because of the inability to provide room aboard ship for the coal that would be necessary for the voyage. The meeting had scarcely adjourned before the news arrived that a ship had just completed a transatlantic trip under steam. In another case a number of individuals seriously promulgated their belief that it would never be possible to successfully lay a cable across the Atlantic, because, as they said, the density of the water below a certain depth would be so great that the cable would not sink to the bed of the ocean. Regardless, however, of these predictions, the cable promptly sank to the bottom of the sea. At that time also, it may be noted, the greatest ocean depths in which cables were laid was only about 16,404 feet. Within the past year a cable has been successfully laid by a German company in the Pacific Ocean in the vicinity of the Luikin Islands at a depth of 26,246 feet. In still another instance the author of a well-known text-book on telegraphy, published in the sixties of the last century, expressed the opinion that while the idea of duplex telegraphy, or the sending of two messages at once over one wire, was very beautiful in its way, it must be looked upon as little more than a feat of intellectual gymnastics, and quite useless from a practical point of view. Within less than a decade after the publication of this opinion, not only was the duplex telegraph in practical operation, but quadrupled telegraphy, or the sending of four messages at once over one wire, was also an accomplished fact. Notwithstanding that instances of this kind could be multiplied, there are still to be found people ready to write themselves down to posterity as erring prophets, and so it will doubtless be to the end of the chapter. Fortunately, however, for the sake of progress, there are, on the other hand, always optimists enough to offset the discouraging views of the pessimists.—*Cassier's Magazine.*



## PEAT AS FUEL.

AMONG the branches of foreign industry which deserve the attention of Americans because of their economy, their recovery or utilization of some raw material which exists unused in our country, or by reason of the fact that they involve the most intelligent application of scientific knowledge to technical processes, none is of more importance than the manufacture of briquettes from peat, lignite, and the dust and waste of coal mines. This subject derives especial interest from the recently averted strike in the coal regions of Pennsylvania, involving the danger of another period of scarcity and high prices. It is reassuring to know that after all, we are not entirely dependent upon this form of heating material; that there are vast areas of swamp in this country which, by the aid of certain mechanical processes, can be converted into excellent fuel. An account of the method employed in this conversion is thought to be timely.

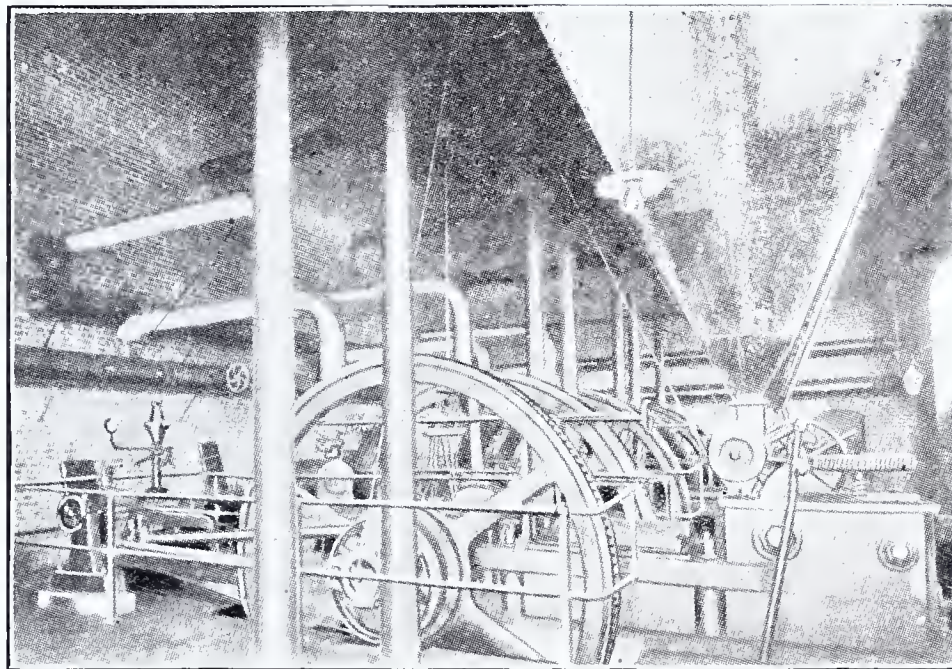
The swamp mud, or peat, in its crude condition, contains usually about 80 per cent of water. Experience has shown that the remaining 15 per cent of substance, if dried and burned as fuel, does not contain enough heat units to evaporate the water which the raw material contained. The essential point in peat drying processes is therefore to eliminate, by drainage and air, every possible atom of water.

As a first step, the bog is drained by means of ditches, cut at intervals to a depth of about 18 inches below the bottom of the peat layer. Into these at least 50 per cent of the water settles, and either flows off by gravity or is pumped out by wind-driven pumps. The drained peat is then excavated, either in blocks cut with an angle spade especially designed for the purpose, which are hauled away in hand cars and laid out on the ground to drain and dry by wind and sun, or by machines which, by means of steel scoops running on an endless chain, dig out the peat, carry it up to a sufficient height, and dump it into hand cars, which transport it to the machines, by which it is further treated and prepared.

The excavating machine, which may be driven by a motor propelled by electricity or other power, is mounted on a portable track of light rails, designed to be moved over the moor as the peat is exhausted by excavation. The machine digs out, elevates and drops into the dump cars a ton of raw peat every five minutes. This is transported to the machine, conveniently located at the edge of the bog, which tears, pulverizes, kneads, and presses the plastic mass out into long masses or "strains" which are cut into sections a foot long and dried in the open air to hard, tough blocks, which resist rain and bear transportation to any distance. The secret of this part of the process seems to be that the crushing and grinding action of the machine releases the fluid organic elements of the raw peat, which, mix-

ing with the solid fibrous portion, form a matrix or binder which, when dry, holds the whole mass firmly together. In drying, the strains shrink to about one half their size when in a plastic state. If mixed while in a soft condition with 20 to 30 per cent of anthracite or bituminous coal dust, they form, when dry, an excellent fuel of high caloric value. Sawdust may likewise be used for this purpose. These dry, pulverized substances, when mingled with the wet peat, not only greatly enhance its subsequent value as fuel, but facilitate the drying process and render it tough, dense, elastic and capable of being pressed cold into briquettes of high quality.

A still more scientific method of utilizing peat appears to be that of converting it into coke by carbonization in retort ovens, with recovery of the gas, tar and other by-products of distillation. The process consists in carbonizing peat in closed ovens,



BRIQUETTE FACTORY, WITH THREE PRESSES OF HORIZONTAL TYPE.

heated by burning under them the gases generated by the coking process itself. Such a plant is therefore self-sustaining, the only fuel required being coal or wood sufficient to heat the oven for the first charge, when the gases generated by the coking process become available and enable the operation to be repeated and continued indefinitely. Not only this, but the off-heat from the retort furnaces passes on and heats the drying chambers, in which the raw wet peat is prepared for the ovens by drying to the point of economical carbonization.

The peat coke produced as the primary product of this process is jet black, resonant, firm, and columnar in structure, pure as charcoal from phosphorus or sulphur, and has a thermal value so high as to make it prized as a fuel for smelting foundry iron, copper refining, and other metallurgical purposes. Crushed and graded, it offers an excellent substitute for anthracite in base burning stoves. In larger lumps, as it comes from the oven, it forms a clean smokeless fuel.

Still another process of treating the peat, which represents the latest step forward in this branch of industry, is by the aid of electricity. The peat is cut and excavated as described, and conveyed to the plant, where it is packed into rotary iron cylinders of a peculiar construction. The cylinders being rotated at high velocity, the centrifugal pressure, aided by an interior heating device, expels all but a small remnant of the water contents. Electrodes connected by conductors with a dynamo, are then inserted in the cylinders in such a manner that the mass of centrifugally dried peat becomes the medium through which is completed the circuit between the electrodes. The resistance offered by the peat, like the filament of an incandescent lamp, generates heat which carbonizes the material, producing a mass of disintegrated black globules, which retain all the valuable elements of the original material. This part of the process, which depends largely upon the conductivity of the peat, may be promoted by moistening the mass with certain cheap liquid chemicals.

From the cylinders the carbonized

## Compressed Air.

Compressed air has not been heralded as capable of all things under the sun, as liquid air was when first introduced, but special conditions have made its use imperative in mines and caissons, until it is now so widely employed as to be the typical engineering power.

More and more are Western mines resorting to waterfalls for power, and often the best method of utilizing this power is in the form of compressed air. Sometimes the difficulty of securing fuel makes the use of steam impossible, and even when it is made, it will soon turn to water in pipes of great length. Electricity needs the services of experts: but compressed air can be easily made, stored for indefinite periods, and transmitted through pipes without loss. It will drill better than any other power; it will hammer better; it will hoist and haul and furnish tractive power: it solves the puzzling ventilation problem without cost, for its exhaust keeps a tunnel fresh and sweet; it can be used by simply uncoupling the nozzle from the drill, to blow a tunnel free of smoke. Its use is so simple that in one place in California where all the timber had been burned, air compressed by waterfall turbines was brought and used in the idle engine: a new equipment was unnecessary.

Compressed air is used for coal and granite cutting and for an increasing number of hand tools, mainly for hammering or boring. In narrow quarters, as in the hold of a ship or under a locomotive, where a man could not swing a hand hammer, not to speak of a sledge, the little air hammer at the end of a hose does its work with adequacy and speed. The power has also been employed to a notable extent in building the New York subway and tunnels, the Chicago drainage canal, and in every great engineering task of recent years.

So far its traction possibilities are in the experimental stage. Compressed air locomotives for mining purposes have proved successful, but few street railways have so far been equipped with it. Yet it would seem that street transportation would be obliged, one day, to adopt either the storage battery or the compressed air system. Trolleys are dangerous, conduits are expensive and likely to be affected by weather conditions; any system dependent upon a circuit is subject to a complete tie-up if an accident happens to the circuit. Each car should be independent of the others. It remains to be seen whether the storage battery or the compressed air car will solve the problem of efficiency, safety and cheapness.

## Electricity for Tanning Leather.

Credulous people, unacquainted with either electrical or tanning science, may readily believe in view of the marvels already accomplished, that sole leather may be tanned by electricity while you wait, but practical men know better. Of course, there have been plausible theories advanced to the effect that electric currents running through the hides accelerate the chemical union of the gelatin of the hide with the tannin of the bark liquor. Investigation and experiment, however, have demonstrated that any hastening of the process was really accomplished by strengthening the liquors or mechanical agitation of the sides. Electricity is a great thing—but not for tanning. —*Hide and Leather.*

The use of aluminum paper with which to wrap butter is said to preserve the sweetness of the butter for a very long period. This ought to provide a good market for such paper, which is practically a new article of production.

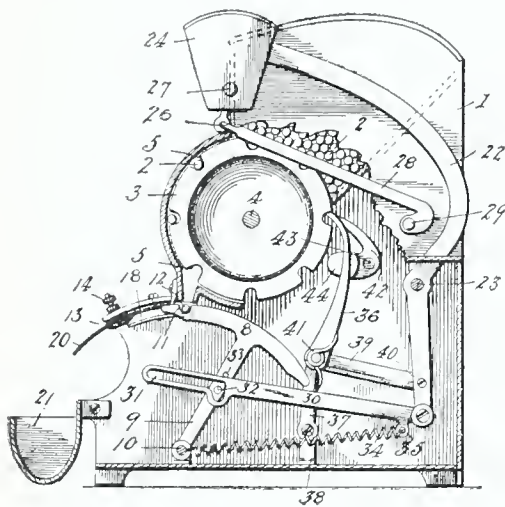


## CLEVER NEW PATENTS.

Cigar Clipper and Match Safe.—Boiler.—  
Pliers.—Collapsible Crate.—Coat-Stay.

### Cigar Clipper and Match Safe.

An exceedingly novel device, which will deliver a lighted match to the purchaser of a cigar, but will eliminate the chance of such purchaser carrying off a supply of matches, has been patented by Messrs. Victor H. Paradis and John B. Putrow, of Rice Lake, Wisconsin. A casing 1 is employed, having match delivering means in the form of a drum 4 that operates through the bottom of a match receptacle 2, and an oscillating projecting device 8, co-operating with the drum and with an igniter. The operating means for the match delivery mechanism is a cigar clipping device 24, pivoted on one end of a lever 22, which, as shown, is connected to the match delivery mechanism and igniter mechanism. The operation of the device is briefly as follows. When the end of a cigar is placed in the clipper 24, and the clipper is pressed down to cut the tip from the cigar, the match delivery mechanism is actuated,

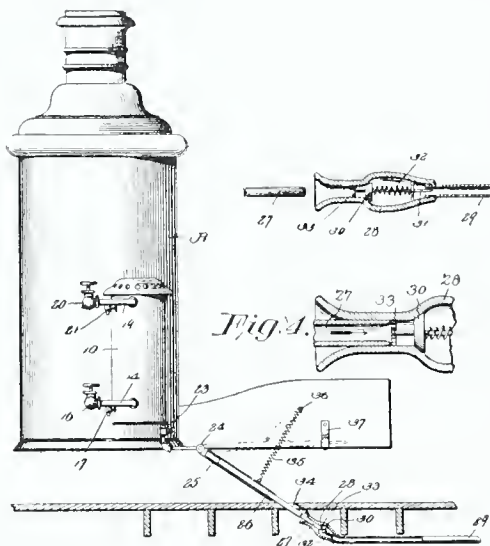


a match is ejected from the machine, and at the same time ignited, so that the operator can secure this lighted match and employ it to light his cigar. As only one match is delivered at a time, when the clipping mechanism is operated, and as this match is ignited, it will be apparent that while the device serves its purpose, it will prohibit any one obtaining a supply for further use. The apparatus is thus peculiarly useful in cigar stores and public places.

### Boiler.

As is well known, the water in the boiler of fire engines is always kept at a comparatively high temperature while in the engine house, and for this purpose, the boilers are usually connected to a stationary heater, located in the engine house. The connections between the circulating pipe of the heater and the fire engine are usually by means of slip joints, and these prove a source of constant annoyance. Mr. Charles C. Rich, of Mount Vernon, N. Y., appears to have entirely eliminated the objection in a very simple manner. As shown in the accompanying cut, he employs a heater 10, which constitutes a part of, and is carried by, the engine, being connected to the boiler A by pipes 14 and 19. These pipes have valves 16

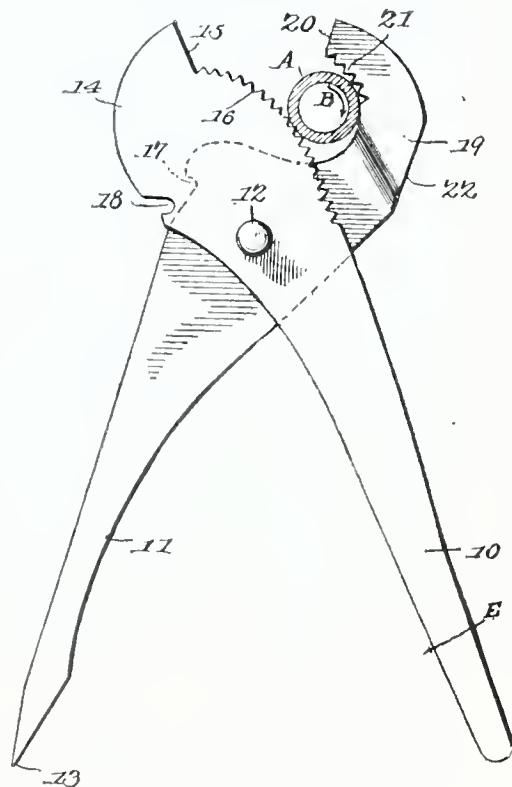
and 20, and draw-off nipples 17 and 21. The heater is preferably a gas burner, which has a connection with a gas supply pipe 29, the connection comprising an automatic valve 30, and a swinging coupling pipe 27 carried by the engine. As long as the engine is in place, the coupling pipe is connected to the supply pipe, and holds the valve, as shown at 30, open. Consequently the gas will flow freely to the burner and heat the water that circulates through the heater and boiler. As soon, however, as the



engine is moved, the coupling pipe 27 slips from the supply pipe 29, the gas valve 30 automatically closes, and the coupling pipe is drawn by a spring 35 upwardly out of the way. When the engine is in operation, the heater 10 may be entirely cut off from the boiler by the valves 16 and 20, and the water drawn therefrom, if desired.

### Pliers.

It is well known that in using pliers upon a round surface, the grip of the jaws must be produced by the pressure exerted by the hand of the user upon the levers. Mr. A. Tracht, of Galion, Ohio, has devised and patented an improvement in pliers, and it is his object to provide a device of this character, wherein the work is gripped at one side of the pivot in such position that the greater the resistance to be overcome, the more tightly will the pliers grip, the work being gripped by even pulling upon one of the levers.



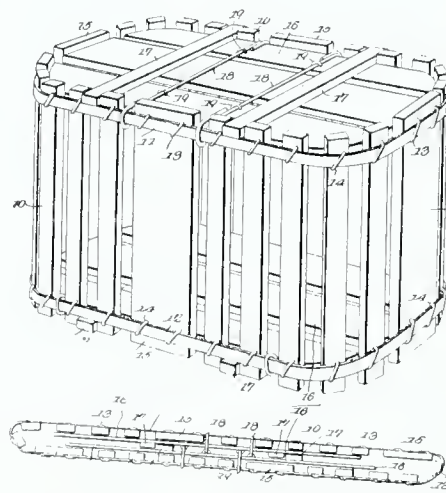
As shown in the accompanying cut, the pliers comprise levers 10 and 11, pivoted, as shown at 12, the lever 11 having a screw-driver 13 formed at

one end. The lever 10 has a jaw 14, provided with a work-engaging face 15 in alinement with the pivot, and a curve toothed work-engaging face formed along one edge. The jaw 11 is also provided with a work-engaging face 20, alined with the pivot, and a concave toothed-engaging face 21 complements the face 16. Notches 17 and 18, formed in the jaws, constitute wire cutters. The jaw 19 furthermore has a flattened face 22, which forms a hammer head.

With the pliers applied to the work, as for instance, a pipe A, it will be evident that a clamping engagement of the levers 10 and 11 will clamp the same. If, however, it is desired to rotate the work in the direction indicated by the arrow B, the handle or lever 10 alone may be grasped, and forced in the direction of the arrow E.

### Collapsible Crate.

A new crate for shipping purposes has been devised and patented by Mr. Edgar A. Keck, of Cotulla, Texas. The crate is collapsible, so that it can be folded when empty for return shipment. As shown in the accompanying illustration, the crate comprises spaced slats 10 secured at their ends to endless bands 11 and 12, the latter being of flexible metal. The ends of



the crate are also formed of spaced slats 16 connected by transverse cleats 17 extended at the ends to project between the slats 10 and bear against the outer edges of the bands 11 and 12 so as to be supported thereby. Suitable catches are employed for connecting the end members to the body portion. The body portion may be manufactured of any desired size or any required shape, and the crate as thus manufactured, may be compactly folded so that it will occupy very little space, as the lower figure of the illustration shows.

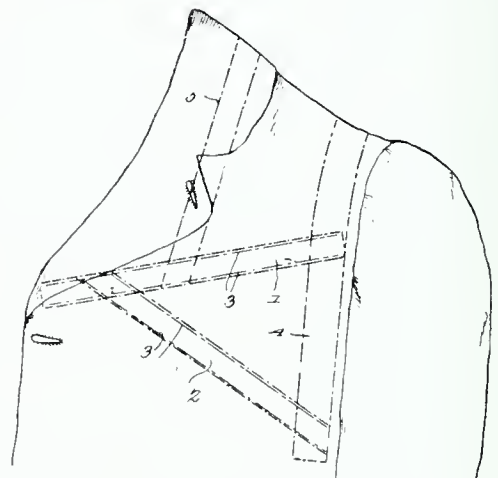
It is manifest that a very rigid and durable crate is produced, which is at the same time light and open to provide for the necessary ventilation of

the contents, or the inspection of the same from all sides.

When the crate is to be emptied, the unbending of the wire clamps at one end will release the closure member, and when the contents are removed, the opposite end member will be similarly released and the body portion collapsed for the return shipment, together with the head closures.

### Coat-Stay.

Frederick C. Klipstein, of Prairie Du Sac, Wisconsin, has patented a coat-stay, the object being to provide means which will prevent a coat from wrinkling, creasing or otherwise



getting out of shape in front. The stay comprises two parts 1 and 2, which may be of whalebone, thin steel, or the like, housed within a sheathing. These stays are connected at one end in any suitable manner, and are disposed in angular relation to each other, the degree of divergence being controlled by the size of the wearer of the coat. The free ends of the stays are secured to a strip of tape 4 of suitable flexible material which operates to hold them properly spaced. Another strip of tape 5 is connected to the stay 1 near the apex of the device, and operates still further to hold the said device properly positioned against shifting.

The stay is disposed between the lining and cloth of the coat, and is held in position by the two tapes 4 and 5, the former being secured at or adjacent to the shoulder seam of the coat. These tapes are suitably sewed in place. By disposing the stay in the manner shown, all tendency for the coat to break between the shoulders and lapel will be positively obviated, and the initial shape given the coat will be maintained as long as the garment is used. The stay being light, it will impart no objectionable added weight to the garment, and being flexible, will readily yield to the movements of the wearer and will thus not be a source of discomfort in use.

## PATENTS, CAVEATS, TRADE-MARKS, COPYRIGHTS, AND DESIGNS. TWENTY-FIVE YEARS PRACTICE.

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## LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

WESTINGHOUSE AIR BRAKE CO. et al.  
v. NEW YORK AIR BRAKE CO.

(Circuit Court, S. D. New York. 140 F. R. p. 144.)

### PATENTS—SUIT FOR INFRINGEMENT—COSTS.

Where the final decree in a suit for infringement entered after an accounting before a master, awarded to complainant substantial damages and the costs and disbursements on the accounting, but on appeal the damages were reduced to a nominal sum because the situation was such that the profits realized by defendant from the sale of the infringing device alone could not be computed, and the mandate allows the costs of appeal, but is silent as to the costs below, the trial court, in entering decree on the mandate, will not change its prior decree as to such costs.

BRYCE BROS. CO. v. SENECA GLASS CO.

(Circuit Court, N. D. West Virginia. 140 F. R. p. 161.)

### 1. PATENTS—PRIOR PUBLIC USE—MANUFACTURING MACHINE.

Where a patent is for a manufactured article itself, designed for general use, a presumption arises that, when the inventor issues such article to the public, he regards it as a finished product, and, in case he does not apply for a patent within two years, abandonment of his purpose to do so may well be assumed; but where the invention is for a machine designed to produce articles, a different rule as to experimental use may well apply, and although the articles produced may be perfect, the machine may not, and the sale of the product does not necessarily render the use of the machine a public use, where none are sold, and the use is entirely under the observation of the inventor.

### 2. SAME—INFRINGEMENT—ENGRAVING MACHINE.

The Schrader patent, No. 592,920, for an engraving machine for etching glassware, was not anticipated, and discloses invention, nor is it invalid for prior public use; it being shown that the use of the machine prior to two years before application for patent was filed was experimental, and that frequent changes and improvements were made during the time. Also, held infringed by the machine of the Shifbauer patent, No. 645,333.

DAYLIGHT GLASS MFG. CO. v. AMERICAN PRISMATIC LIGHT CO.

(Circuit Court, D. New Jersey. 140 F. R. p. 174.)

### 1. PATENTS—INFRINGEMENT—MACHINE FOR MAKING PRISMATIC GLASS.

The Cummings patent No. 695,282, for a machine for making prismatic glass, discloses invention, and is valid. Also held infringed.

### 2. SAME—VALIDITY—PRISMATIC GLASS WINDOWS.

The Cumming patents Nos. 695,283, 695,284, and 710,434, covering methods of making panes or windows from prismatic glass, and for such windows themselves, are void as embodying only the function of a machine invented and patented by the patentee, or for lack of invention in view of the prior art.

JECKES-EVANS MFG CO v. HEMP & CO.

(Circuit Court of Appeals, Eighth Circuit. 140 F. R. p. 254.)

### 1. PATENTS—VALIDITY—ADJUDICATION ON DEMURRER.

While a patent may be adjudged void on demurrer to a bill for its infringement for invalidity manifest on its face, it should not be so adjudged if the court has any doubt on the question, but the patentee should be given the opportunity to adduce evidence in support of the presumption of validity arising from the grant.

### 2. SAME—INVENTION—STOVEPIPES.

The Evans patent No. 481,856, for a stovepipe having a lock for the engaging edges of each joint, so that they may be disengaged, and the sheets flattened out for transportation, and again put together by the hands without tools, or locked against such disengagement, is not so obviously lacking in invention as to warrant its being declared void on demurrer.

REECE FOLDING MACH. CO. v. FENWICK et al.

(Circuit Court of Appeals, First Circuit. 140 F. R. p. 287.)

### 1. CONTRACTS—SALE OF FUTURE INVENTIONS—VALIDITY.

A contract by an inventor, who has sold inventions, to disclose and assign to the purchaser any future inventions made by him for improvements thereon, is not contrary to public policy, but is valid and enforceable, if based on a valuable consideration.

### 2. SAME—ENFORCEMENT—ESTOPPEL.

Defendant contracted to assign to complainant any future inventions he might make in a certain art, but, on being discharged from complainant's service, regarded the contract as terminated, in which view complainant apparently acquiesced, permitting defendant to expend his time, efforts, and money in developing and exploiting new inventions in the belief that they were his own. Held, that complainant was estopped to claim that the new inventions so made or developed were within the contract, but that it might be entitled to a specific enforcement in relation to an invention made previously and for which an application for a patent was pending, and that it was entitled to a disclosure with respect thereto.

### 3. APPEAL—REHEARING.

Where a decree was reversed on appeal, and the cause remanded, with directions for a specific discovery with respect to a certain invention made by defendant and the granting of such relief as might be warranted thereby, a rehearing was desired on an averment by appellee that the facts sufficiently appear from the record to enable the court to make a final adjudication, where no such claim was made on the hearing.

FITCH et al. v. SPANG, CHALFANT & CO.

(Circuit Court, W. D. Pennsylvania. 140 F. R. p. 292.)

### PATENTS—INFRINGEMENT—MACHINE FOR FORGING SOCKETS.

The Fitch & Shaler reissued patent, No. 6,404 (Original No. 134,045), for a machine for forging metallic sockets, usually employed for joining the ends of water or gas pipes by welding and finishing the same on a mandrel by means of dies, construed, and held not infringed.

WALKER et al. v. GLOBE NEWSPAPER COMPANY.

(Circuit Court of Appeal, First Circuit. 140 F. R. p. 305.)

### COPYRIGHT—REMEDY FOR INFRINGEMENT—ACTION FOR DAMAGES.

Rev. St. § 4952 [U. S. Comp. St. 1901, p. 3406], having vested the author or proprietor of any map, chart, etc., who complies with the provisions for securing a copyright, with a property right therein, such right may be protected by all the means known to the general rules of law, by suits for damages or in equity, and the right to maintain an action at law to recover damages for infringement of a copyright of a map is not taken away by implication by the remedies given by sections 4903, 4970 [U. S. Comp. St. 1901, pp. 3414, 3416]; the first providing for a suit to forfeit copies found in possession of defendant and to recover penalties based thereon, and the second for suits to enjoin future infringements, neither of which remedies is adequate in certain cases.

O. H. JEWELL FILIER CO. v. JACKSON.

(Circuit Court of Appeals, Eighth Circuit. 140 F. R. p. 340.)

### 1. PATENT—A CONTRACT—RULES FOR CONSTRUCTION OF CONTRACTS APPLY.

A patent is a contract made by the acceptance by the government of the proposition made by the inventor in his application. The rules for the interpretation of contracts govern its construction. The intention of the parties when the patent issued must be deduced, if possible, not from a part of the contract, but from the entire agreement.

### 2. SAME—CONSTRUCTION—SPECIFICATION AND CLAIMS MUST BE READ TOGETHER.

The specification of a patent which forms a part of the same application as its claims must be read and construed with the latter, not for the purpose of expanding, nor for the purpose of limiting or contracting the claims, but for the purpose of ascertaining their true meaning and the intention of the parties when they were made and allowed.

### 3. SAME—CLAIM "SUBSTANTIALLY AS SPECIFIED" GOVERNED BY SAME RULE.

The same rule governs the construction when the words "substantially as specified"

are found in a certain claim, for the claim is founded upon, and is explained by, the specification, whether these words appear in it or not. The words "substantially as specified," in a claim, refer to the elements, construction, and operation set forth in the specification.

### 4. SAME—ELEMENTS IN SPECIFICATION ESSENTIAL TO COMBINATION CLAIMED.

Mechanical elements described in a specification, which are essential to the operation in the way portrayed in the specification of a combination claimed, and those that are thus indispensable only, may be read into a claim from the specification.

### 5. SAME—INFRINGEMENT—WHEN CHANGE OF FORM OF ELEMENT IS NOT.

Mere changes of form of a device or of some of the mechanical elements of a combination secured by a patent will not avoid infringement, when the principle or mode of operation of the invention is adopted, and the form of the machine or of the elements changed is not the distinguishing characteristic of the invention. But, when the form of a mechanical element of a patented combination is the essence of the invention claimed, a change in it which prevents the combination in which it is embodied from utilizing the principle or mode of operation described in the patent to attain the result desired, is not an infringement.

### 6. SAME—ESTOPPEL BY CLAIMS.

The statute (Rev. St. § 4888 [U. S. Comp. St. 1901, p. 3383]) requires an inventor to particularly point out and to claim distinctly the improvement or combination which he desires to secure as his discovery, and, when he has made his claims, he has thereby disclaimed and dedicated to the public all other devices, combinations, and improvements apparent from his specification, and claims that are not mere evasions of those claimed as his own, and he is estopped by his patent from thereafter claiming a monopoly as to such devices, combinations, or improvements.

### 7. SAME—CONSTRUCTION OF CLAIM 6 OF LETTERS PATENT 509,126—INFRINGEMENT.

The carrying arm of the sixth claim of letters patent No. 509,126, for improvements in filters, is the arm described in the specification, which is composed of two bars rigidly fastened together in such a way that one is an extension of the other and that they carry their finger bars in two series movable in different planes. The sixth claim is not infringed by the combination of a straight arm which carries its finger bars in one series in the same movable plane with the other elements of the patented combination.

### 8. SAME—ABSENCE OF ONE ELEMENT OF COMBINATION AVOIDS INFRINGEMENT.

The absence from a device that is alleged to infringe a patented combination of a single element of that combination is fatal to the claim of infringement.

PENNSYLVANIA GLOBE GASLIGHT CO. v. CLEVELAND VAPOR LIGHT CO.

(Circuit Court, D. Rhode Island. 140 F. R. p. 348.)

### PATENTS—ANTICIPATION—INCANDESCENT LAMPS.

A preliminary injunction against infringement of the Campbell patent, No. 447,551, for an incandescent burner and method of using the same, denied on evidence not before the court in a prior suit and raising new questions under the defense of invalidity.

AMERICAN ELECTRIC NOVELTY & MANUFACTURING CO. v. STANLEY & PATTERSON.

(Circuit Court, S. D. New York. 140 F. R. p. 444.)

### PATENTS—INFRINGEMENT—ELECTRIC BATTERY.

A preliminary injunction granted, restraining infringement of claim 1 of the Hoggson patent, No. 520,429, for an electric battery.

UNITED STATES FASTENER CO. v. BUTEZ.

(Circuit Court, N. D. New York. 140 F. R. p. 556.)

### PATENTS—INFRINGEMENT—GLOVE FASTENER STUD.

The Pringle patent, No. 720,616, for a stud, forming one member of a glove fastener, construed, and held infringed.

THOMSON-HOUSTON ELECTRIC CO. v. SALEM ELECTRIC CO.

(Circuit Court, D. New Jersey. 140 F. R. p. 445.)

### PATENTS—VALIDITY AND INFRINGEMENT—SYSTEM OF ELECTRICAL DISTRIBUTION.

The Thomson and Rice patent, No. 413,293, for a system of electrical distribution espe-

cially adapted to lighting purposes, and having for its objects to run translating devices in series and in multiple on one and the same system and from one and the same source of supply, was not anticipated, and discloses invention. Also held infringed as to claims 1, 3, 4, and 6.

NATIONAL ELECTRIC SIGNALING CO. v. DE FOREST WIRELESS TELEGRAPH CO. et al.

(Circuit Court, S. D. New York. 140 F. R. p. 449.)

### 1. PATENTS—CONFLICTING CLAIMS TO INVENTION—PRESUMPTION FROM GRANT OF PATENT.

The fact that an invention was first operated by another than the patentee does not rebut the presumption of invention by him, arising from the granting of the patent, where both persons were present at the time of such operation and each claims to have been the originator of the experiment from which the invention sprang.

### 2. SAME—INFRINGEMENT—WIRELESS TELEGRAPHING APPARATUS.

The Fessenden reissue patent, No. 12,115 (original No. 727,331), for a receiver for electro-magnetic waves, held, not anticipated by patents Nos. 716,000, and 716,203, dated December 16, 1902, and granted to De Forest and Smythe, nor covered by No. 709,744, dated August 12, 1904, and granted to Fessenden, this patentee, and to be valid as against the claim that the invention was made by another than the patentee. Claims 11, 23, and 25, also held infringed.

### 3. SAME—SUIT FOR INFRINGEMENT—COSTS.

Rev. St. § 973 [U. S. Comp. St. 1901 p. 703], providing that costs shall not be recoverable when a decree is entered for infringement of part of a patent, where the patentee has claimed to be the inventor of a material part of the thing patented, of which he was not the inventor unless a disclaimer was entered prior to the bringing of the suit, applies only where a disclaimer is necessary to save the patent.

SAMPSON & MURDOCK CO. v. SEAVER-RADFORD CO.

(Circuit Court of Appeals, First Circuit. 140 F. R. p. 539.)

### 1. COPYRIGHT—SUIT FOR INFRINGEMENT—FORM OF INJUNCTIONAL DECREE.

Where, on the trial of a suit for infringement of a copyrighted city directory, the court found that defendant's directory contained certain infringing matter but it was of such character that it could be separated from the original matter, a decree is proper which merely restrains the sale of defendant's directory only so long as it contains any of the infringing matter therein enumerated.

### 2. SAME—INFRINGEMENT—DIRECTORIES.

Complainant published a general directory of the city of Boston in July, 1903, purporting to give facts as they existed in the spring of that year, and which was duly copyrighted. In February, 1904, defendant published a general directory of the city, which purported to give the facts as they existed just prior to that time. After completing its original canvass for names, defendant copied on slips from complainant's directory such names there printed as it had not obtained in its own canvass, with the information given about them, and with such slips as a guide it verified them by sending canvassers to the addresses given therein, and, when found correct, reprinted the same without alteration in its own directory. Held, that such republication was an infringement of complainant's copyright.

THOMSON-HOUSTON ELECTRIC CO. v. STERLING-MEAKER CO.

(Circuit Court, D. New Jersey. 140 F. R. p. 554. Application for Preliminary Injunction, January 23, 1906.)

### 1. PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

Where the validity of a patent has been sustained after protracted litigation, the only question open on motion for a preliminary injunction in a subsequent suit against another defendant is the question of infringement, unless evidence of invalidity is introduced of such conclusive character that, if introduced in the former case, it would probably have led to a different conclusion.

### 2. SAME—TRAVELLING CONTACT FOR ELECTRIC RAILWAYS.

Infringement of the Van Depoele reissued patent, No. 11,872 (original No. 495,443), for a travelling contact for electric railways, held so doubtful on the showing made as not to warrant the granting of a preliminary injunction.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured  
through the Patent Soliciting Office  
of E. G. Siggers, Patent Lawyer,  
Washington, D. C.

Marshall J. Riggs, Marietta, Ohio. Automatic Rope Spear.—The device of this patent is designed for extracting lost ropes from oil wells, and it is adapted to be readily forced through a rope, without packing the same against the bottom or sides of a well, and when drawn upward it will securely grip the rope, whereby the latter may be conveniently removed. It operates effectively in both large and small well casings, and the rope engaging means folds substantially within the device when the latter moves downward. The body of the device is composed of two similar sections welded together at their lower ends and having corresponding recesses in their abutting faces. A shank is welded to the upper ends of the sections. The lower end of the body is tapered, and rope engaging prongs are pivotally mounted in the recesses. These prongs, which are tapered, are slightly curved, and present inner convex faces and outer concave faces. Means are provided for limiting both the inward and outward movements of the prongs, which project slightly when at the end of their limited inward movement.

Clarence W. Parks, Lowell, Mich. Cream Separator.—The cream separator of this patent is adapted to rapidly reduce the temperature of milk to produce a separation of the cream, and it is provided with means for removing all of the gases and odors, which are discharged into the outer air without permitting the entrance of insects, etc. The warm gases, in escaping, cause a circulation of cold air, which displaces the warm air and gases, whereby the latter will be caused to escape more rapidly. In this manner the milk is thoroughly aerated. The cream separator, which is provided with inner and outer receptacles, has a cover which is fitted on the outer receptacle. The inner receptacle, which contains the milk, is open at the top, and the outer receptacle, which receives the cooling liquid, has an air tube communicating at its lower end with the outside air, and having its inner end arranged adjacent to the top of the inner receptacle. The cream separator is provided at the top of the cover with a screen covered opening through which the warm air and gases pass out at the top, and cool air is caused to flow upward through the tube to take the place of the escaping air and gases.

William A. Grant, inventor; Denslo D. Hamlin, assignee, Brooklyn, N. Y. Door Lock.—It is the aim of the present invention to prevent a key from falling out of a lock when a door is slammed, and it also prevents the removal of a key from a door by small children, and the consequent loss of the key. It permits a key to be readily introduced into a lock, and will enable the key to be easily removed by a person acquainted with the manner of operating the device. The device consists of an L shaped catch pivoted at its angle and provided at one arm with a lug or projection, which is arranged adjacent to the key hole. The other arm of the catch is provided with a laterally extending pin, which is operated by the roll back of the lock. The locking device is normally held in engagement with the key by a spring, and when it is desired to remove the key, the knob of the door is turned to disengage the catch from the key. The device, how-

ever, is susceptible of operation in a variety of ways, as one arm of the catch may be provided with mechanism for enabling it to be operated from the exterior independently of the roll back and the door knob.

Frank E. Dewey, Fort Collins, Colo. Beet Harvester.—This patent marks a radical departure in the manner of adjusting the various parts of beet harvesters. It first tops the beets, and then plows the same out of the ground and loosens the soil around the beets. The beets are then picked up and cleaned by the machine. The harvesting machine is designed particularly for operating on sugar beets, and it is adapted to deposit the tops and the beets in separate bunches and at different points, so that the same may be readily gathered and hauled away. The beet topping devices are automatically raised and lowered as the machine is moved forward, by means of a fluid under pressure. The frame of the machine is provided with longitudinal and upright tubes, and the longitudinal tubes receive pistons, which are connected with the beet plow. A beet tonper is located in advance of the plow, and an elevator is located between the beet tonper and the plow. A rotary picker operates in rear of the plow, and pistons are also arranged in the upright tubes and are connected with the beet tonper, the elevator and the rotary picker. A gage wheel, which is located at the front of the machine, is provided with a piston, which operates in one of the vertical tubes for automatically actuating the upright pistons. Means are provided for operating the longitudinal movable pistons by hand.

Lewis C. Martin, Loudon, Tenn., inventor; George M. Burdett, assignee, Lenoir City, Tenn. Invalid Bed and Lifter.—The present invention has for its object to provide an apparatus designed for use both in homes and in hospitals for handling invalids. It is adapted to support a patient or invalid in a variety of positions, and will enable him to conveniently assume a sitting position, and to be readily turned on either side, when in a reclining position. The apparatus comprises an approximately rectangular supporting frame, which is arranged around the intermediate portion of a bedstead between the head and foot thereof, and which is provided with a pair of horizontal guide rods. Suspended from the guide rods is a movable support, which is tiltable both laterally and longitudinally. The support is provided at its ends with hinged frames, and it is connected with hangers by means of windlasses, which are arranged in pairs. The hangers slide on the guide bars of the supporting frame for moving the tiltable support transversely of the bed.

James H. Gasson and William L. Douglass, Missouri Valley, Iowa, inventors; E. E. Gasson, Stanton, Iowa, assignee. Mold for Making Paper Board Receptacles. It is the aim of the present invention to provide a mold for making paper board burial caskets and other receptacles, and to enable the parts to be readily adjusted for constructing such articles with either thick or thin walls. The mold enables a burial casket to be made without the formation of the ridge, which has heretofore been left on the exterior, and which has had to be planed or dressed off after the burial casket has been removed from the mold. The mold comprises a form, having sides and ends hinged at the bottom, a core, links hinged to the core and arranged to swing inward and outward, and cam levers connected with the links and detachably engaging the ends and sides, and adapted to be swung over upon the core. The sides and ends of the form are pro-

vided with standards, which are hinged to the arms of a spider, that is secured to the bottom of the form.

Elijah P. Hollis, Greenville, S. C. Combined Stalk Cutter, Root Extractor and Fertilizer Distributer.—This patent relates to an ingenious machine adapted to operate on the tall stalks of cotton plants in the spring for preparing the soil for the seed. The machine embodies a rotary cutter which carries the rest of the machine, the main frame being mounted on the journals of the rotary cutter. The rotary cutter consists essentially of a pair of wheels located at opposite sides of the machine and connected by spaced blades, secured at their terminals to the rims of the wheels and extending entirely across the machine. The roots are lifted from the ground by a plow, which operates in rear of the rotary cutter, and the mechanism for dropping the fertilizer in the furrow is operated by the rotary cutter. When the plow is lifted from the ground, the mechanism for dropping the fertilizer is automatically thrown out of operation.

Bud H. Laughunn, Centralia, Ill. Pick.—The improvement covered by this patent is applicable not only to picks, but to various other forms of tools. It firmly secures the handle to the head of the tool, and braces the handle in a manner to prevent the same from breaking at its point of attachment to the head. The head of the tool is provided at its side faces with recesses, and it has a socket extending from its lower face and terminating short of its upper face. A handle is secured in the socket by means of a combined clamp and brace, composed of sections arranged at the side faces of the head and the handle, and having upper flat portions fitting in the recesses of the head. The lower portions of the sections are approximately semi-tubular and embrace the handle. The side edges of these lower portions fit together and form a continuation of the socket of the head, and the upper edges of the semi-tubular portion fit against the lower portion of the head. The parts are secured together by means of upper and lower fastening devices. The upper fastening device pierces the clamp and head of the tool, while the lower fastening device, which is spaced from the head, passes through the sections of the clamp and the handle.

Amos G. Cox, Winterville, N. C. Fertilizer Distributer.—It is the aim of the present invention to discharge and cover guano, and to provide means for enabling the feed to be easily changed, and when necessary entirely cut off, without stopping the draft animals. The machine embodies a hopper, and a shaking shoe pivoted at an intermediate point of its length and located below the hopper, with one end extending in advance of the same, and the other projecting in the rear thereof. A tappet wheel engages the front of the shoe, and a feed regulating closure, which is located at the back of the hopper, is adapted to engage and swing the shoe out of the path of the tappet wheel.

Ernst and Henry V. Schroeder, Minier, Ill. Portable Grain Dump and Elevator. Two patents.—Both of these patents cover important improvements in portable grain dumps. The first patent relates more especially to the gearing for raising the dump, and to the operating mechanism for controlling the downward movement of the same to permit a wagon body to be slowly lowered to a horizontal position, after the same has been raised to an inclined position for dumping, and the operation of the

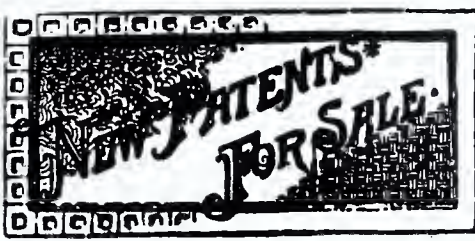
dumping completed. The portable grain dump and elevator is provided with a device, adapted to be set or arranged for automatically throwing the hoisting gearing out of operation, when the wagon is raised to the desired elevation. The dump for raising one end of a wagon is attached to flexible connections, which are adapted to be wound around a transverse overhead shaft. The transverse shaft is connected by gearing with a longitudinal shaft, that is operated from the elevator. The gearing for connecting the transverse and longitudinal shafts is thrown into and out of operation by means of a clutch, having a movable member, which is connected with an operating bar. The dump is provided with means for engaging the operating bar to automatically stop the upward movement of the dump.

The portable dump and elevator of the second patent is provided with means for enabling a team to be readily hitched to it, and it has an adjustable supporting wheel located beneath the elevator at a point where there is the greatest weight, and capable of being arranged either longitudinally or transversely of the apparatus. The frame of the apparatus is provided at one side with a longitudinal runner, and an axle extends from its opposite side. The axle is provided with a pivoted spindle, on which is mounted a wheel and which is adapted to be arranged either longitudinally or transversely of the apparatus. The mechanism for hoisting a wagon is provided with wagon engaging device, consisting of hinged rods, having loops for engaging the hubs of the wheels.

Charles J. Shellenberger, Bowles, Ind. Ter. Boiling Wheel Device.—This patent relates to the art of treating wooden vehicle wheels, so as to expand and tighten the same after they have become dried and shrunken. It consists of an up-standing approximately cylindrical body, open at the top and bottom and adapted to be placed over and removed from a fire, and a substantially horizontal partition located between the top and bottom of the body and dividing the latter into a shallow wheel-receiving compartment and a deep lower fire chamber or compartment. The partition is inclined downwardly and inwardly from its periphery to its center, where it is provided with a cylindrical depression, arranged to receive and support the hub of a wheel, whereby the device is adapted to support the wheel in a horizontal position with its felly close to the bottom of the upper compartment. The device is also provided with a smoke pipe, and with means for controlling the draft. The liquid bath for the wheel is heated in the shallow wheel-receiving compartment, which reduces the amount of the liquid required to cover a wheel to a minimum, and which insures effective treatment of the hub as well as the rim or felly.

John A. Mansold, Moundsville, W. Va. Combined Badge and Pencil Holder.—The device of this patent provides a connection between the badge and the holder, adapted to pass over the edge of the outer pocket wall and yieldably engage the same for clamping the badge and the holder on the wall of the pocket, so that the device will be securely held against accidental displacement. The device consists of spaced fingers interlocked with the badge, a clamping loop, and spaced intermediate clamping jaws connected at their upper ends with the fingers and at their lower ends with the sides of the clamping loop. The intermediate clamping jaws co-operate with the fingers and the badge to clamp a pocket, and with the clamping loop to engage a pencil.





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## Electricity on Steam Railroads.

The rapid encroachment of electricity upon the field so long occupied by steam power is the most striking feature in the current record of railway activity. When the first street car propelled by electric power passed through the streets of Richmond, Virginia, in 1888, enthusiastic advocates of this system of propulsion hailed the event as the deathknell of the steam locomotive. These prophecies were premature: electricity has not yet supplanted steam, but there are indications that the battle which has been waged between the two forms of motive power is about to come to a climax.

The electric car motor, when introduced, had a capacity of only 15 horse power; it is now built up to 500. From propelling cars in the streets it advanced to suburban and interurban lines, until there are now many electric roads parallel with and competitors of the steam roads. The latter for a long time regarded the new motor as a negligible quantity, partly through innate conservatism, partly because they realized that to adopt a new system would mean a revolution in railway methods, with enormous attendant expense. But with the progress in electrical development, the attitude of the railway companies has changed from scorn to respect. The number of electric roads has grown rapidly, and wherever they appear in competition with the steam lines as handlers of local or suburban freight, they drive their rivals from the field. As a result, practically every trunk line has established electric roads under its own control, and many are now preparing to install the new motive power on their main systems.

It has been known for some time that electricity was to be used for passenger service on the New Haven road in the vicinity of New York, but the use of such power beyond suburban limits was not predicted for the near future. The general manager of

the road now says that electric power will be used for the entire passenger service as far eastward as New Haven. It may be inferred that in time steam power for passenger trains will be displaced by electric force throughout the company's extensive system between New York and Boston. The Erie is about to use this power for 250 miles of its suburban service in New Jersey, and the work of substituting electricity for steam on the West Shore road, from Syracuse to Rochester, was begun early in this year.

The Pennsylvania Railroad has for some time operated electric trains on its Long Island division, and this work is being steadily extended. The same company has made arrangements for electrical equipment of its line from Philadelphia to Atlantic City. The trains that run on this branch, as is well known, make record speed, and the service has been considered a model. Nevertheless, the entire system is to be changed, and when a company like the Pennsylvania takes such a radical step, it may be assumed it has decided that the new departure is essential from a business point of view.

The Grand Trunk line has contracted for electric power to operate its roads under the St. Clair River, between Detroit and Windsor, because it has demonstrated to its own satisfaction that electricity would be cheaper than steam: the Illinois Central is making similar preparations to introduce electricity. Even more far-reaching is the action of the New York Central, in issuing \$150,000,000 additional stock to be used in extending its lines by electric roads. The main line is now being equipped with an electric system, to run trains from the Grand Central depot in New York city up to Albany; and there will soon be a continuous electric road from Albany to Niagara Falls, paralleling the main line of the Central and including the trolley systems of Schenectady, Utica, Syracuse and Rochester. By and by all the trolley lines worth having will be owned by the present steam companies and electricity will be the motive power for all the railway passenger service in the thickly settled parts of the country.

The advantages of electricity over steam are so well known that reiteration is unnecessary. But besides the profits to the railways, the traveling public will derive many benefits from the substitution. The operation of electric trains being cheaper, there will be many more trains and thus better accommodations. There will be no smoke, no cinders, no dirt, no nauseating smells, and the noise will be diminished.

Apart from the revolution in transport methods involved in this change, the effect upon the electrical industry is worthy of attention. It is estimated that upwards of half a billion dollars have been appropriated by various railroads in the country to be used in the purchase of electrical machinery. This means an unexampled activity in the history of this business, and emphasizes the fact that the electric era has dawned.

## A Substitute for Coal.

The constant friction between operators and miners in the coal regions of this country, with the recurrent rumors of strikes and the consequent menace to the comfort of the public—for whether the fault lies in the extortions of the mine owners, or in the exactions of the union leaders, the public is always the chief sufferer—makes it imperative that some fuel substitute should be found which would render the people independent of this monopoly. It is indeed indicative of a meek and long-suffering spirit that, in a climate where reliance must be had upon artificial means of heating for a large part of the year, no greater effort has been made to find something that would supply this general need. It is all the more surprising in view of the fact that the earth we tread on is available for this purpose, and it is utilized successfully in countries not so well provided with coal deposits as our own. Peat, found in swampy sections unadapted for agricultural treatment, dried and compressed into briquettes, makes a most satisfactory fuel for general heating purposes, and can even be used for locomotives, for smelting in reverberatory furnaces, and for many other industries.

The task of converting peat into serviceable fuel consists in cleaning the material of roots and rubbish, reducing the water to a small percentage, and so condensing the peat in volume that its thermal value shall be raised to practical efficiency. This is done by various methods, some of which are described and illustrated in another column of this edition. There are in New England, western New York, Michigan, Illinois, Wisconsin, Oregon, and Washington vast beds of peat which have been thus far hardly explored. New Jersey contains extensive peat beds, within easy distance of the coast, which have never been utilized. In Alaska and on the islands which lie along its shores—where the limited supply of coal brought from British Columbia sells for \$20 per ton, and men perish from cold for want of fuel—there is a practically inexhaustible supply of peat of the best quality, all of which would be available as fuel if carbonized and converted into coke or briquettes. This form of fuel has further advantages: it is clean and convenient to handle; it can be lighted easily and quickly, and burns with practically no smoke. The importance of the last characteristic in lessening the smoke nuisance which has become such a problem to our municipalities, need hardly be pointed out. The general use of briquettes for domestic fuel in a large, densely built city, as well as for generating steam in a number of industrial plants and factories, would operate effectually to reduce that cloud of dusty smoke that hangs over so many of our busy centres of population. The absence of this smoke is at once observed by American visitors to manufacturing cities in Germany and France, and it is to be attributed in part to the scientific construction of boiler furnaces and

chimneys, and also to the standard of skill required among firemen who stoke furnaces with coal for industrial purposes. It is not every strapping laborer who can shovel coal who is permitted to stoke a boiler furnace abroad: he is first taught the theory and practice of economical firing, by which the coal is distributed in such manner and quantity over the grate surface as to secure the most perfect combustion of its volatile elements. But the chief reason is the preponderant use of briquettes of peat, lignite and similar substances.

It is to be hoped that some effort will be made to utilize the wasted and neglected fuel materials which exist in such abundance in this country, thereby effecting our emancipation from the coal trust and developing a new industry by the use of processes which have been tested and proven to be efficient by the older and more economical peoples of Europe.

## King Corn.

Corn is the most versatile of all agricultural products: it may be put to a hundred uses. A little more than half a century ago, this grain was thought to be fit for nothing but coarse food, for cattle feed, and for making whisky. Now multitudes of products and by-products are evolved from our national grain. Primarily it is regarded as an article of diet. The food elements include forms of cellulose, vicose, pyroxyline and amyloid. It may be cooked in scores of ways, from roasted ears up through boiled mush to various delicacies, hulled corn, hominy grits, corn flakes, fritters, puddings, samp, cream meal, pancakes, maizena and loaves of bread and cakes made from bolted corn flour, besides other palatable dainties too numerous to mention. It yields three kinds of sugar and two each of syrup and molasses. Then there are the varieties of starch and glucose. Thirty years ago, practically no glucose was manufactured in America; now we export a quantity of this product every year, and foreign glucose made of rice, wheat, potatoes or sago cannot rival that of our own manufacture.

The kernel is separated into four parts: the outer covering which makes the bran, the glutinous portion, the starchy formation, and the little white germ which was long thought to be worthless except for germination. Apparatus was invented to crack the kernel and release this germ, which, on being given a bath, floated off, leaving the other elements behind. But presently it was found that this little germ was the most valuable part of the grain, weight being taken into consideration. It contains a rich golden oil, which, extracted under high pressure, is worth more than any of the other constituents. When purified by distillation it is so sweet that it is used for salads, and is much more acceptable for this purpose than the cotton seed product which is widely sold under the name of olive oil. Corn oil will keep longer than most vegetable oils without becoming rancid, and it is being manufactured in millions of gallons.

This same oil, after having been



subjected to a vulcanizing process, is used as a substitute for rubber. This is employed for buffers on railway cars, or, with a compound of commercial rubber, in the manufacture of rubber shoes, tires, blankets, linoleum, etc. The crude oil goes to the soap makers, and the residue is valuable as food for cattle.

As noted in a recent number of the INVENTIVE AGE, the pith of the corn stalk has been found to be the best possible material for packing between the plates of battle-ships. It not only offers a barrier which is difficult for shot to pierce, but serves to stop holes on account of the absorbent qualities of the pith, which swell so as to close the opening temporarily. Fine paper is also prepared from this pith. By the aid of machinery, the leaves of the corn plant are cut, the ears husked and the stalks bound into bundles. These go to the depithing plant where the pith is rolled into sheets and converted into paper, the outer fiber being utilized for box board. It is noteworthy that the cost of making paper from corn stalks is only about one third that of manufacturing it from rags or pulp.

But the list of the products of corn is not yet exhausted. There are the substances useful in the arts—celluloid, collodion, sizing, varnishes, films, filaments for incandescent lights, artificial silk, guncotton, smokeless powder, and fine charcoal. There are brewer's grits, brewer's degerminated meal, alcoholics, fermentum, several kinds of gum, grape, sugar, salves, laundry starch, and fusel oil. Shuck mats, shuck mattresses and corn cob pipes may also be mentioned. In short, there seems no limit to the resources of King Corn.

#### Preventing Derailments of Trains.

A railroad official has recently patented a preventive appliance against the derailment of trains, which, it is claimed, will considerably decrease the dangers and damages, as well as those resulting from broxen axles or tires.

A rail is adjusted to the truck of the car parallel with the axle, so that it is in a position across, and about an inch above, the rails. Should a derailment of the wheels take place, these cross rails will lie upon the rails of the track without letting the wheels touch the ground. The car will then drag along upon the cross rails and these, acting as a brake, will slowly stop the whole train. In order to break the force of the settling of the car as much as possible, the cross rails are so adjusted that they are near to the rails of the track and are, in addition, supplied with springs. The cross rails are also supplied with projections underneath for the purpose of preventing the car from leaving the track.

The advantages expected are that a derailed car will not be suddenly stopped, will not fall with undiminished force upon the rails of the track or upon the ties, and will not be dragged with the wheels upon the latter, but will be stopped slowly through the action of the cross rails.

#### Moving Platforms in New York.

Although the New York Subway (built at enormous expense and inconvenience through the very heart of the city, and heralded at its opening as the avenue of relief for the congestion of transportation) has been in operation but a few months, it is already apparent that the hopes founded upon it are doomed to disappointment. In fact, the increase of traffic at certain hours, has been so great as to vitiate the aid afforded not only by the subway, but by the improvements in the trolley and elevated service. Since the Rapid Transit Commission has tacitly admitted its inability to provide immediate or even fairly prompt remedial measures, the proposition to test the moving platform railway on the Williamsburg Bridge has aroused the deep interest of transportation experts.

The promoters of the plan propose—and the project, it is said, is being favorably considered by the Bridge Commissioner—to establish on the bridge a moving platform provided with seats holding three or four persons, traveling at the rate of from 9 to 12 miles an hour. If, on being put into operation, the railway proves entirely practicable, the company will ask for permission to run the platform through subways to be constructed from the ends of the bridge to connect with the main arteries of traffic in Brooklyn and Manhattan.

The company promoting this scheme was anxious to make the test upon the Brooklyn bridge, where the congestion is always at its worst; but the fact that this aerial thoroughfare is soon to be closed to the public for reconstruction, caused the selection of the Williamsburg Bridge, as embodying many of the same conditions.

The advantages of the moving platform—first brought to the attention of the public at Chicago—are that it combines the promise of absolute absence of congestion at stations with the facts of great carrying capacity and small cost of operation. A traffic utility without weight or smoke or noise, where crowding and waiting are fundamentally impossible, where passengers and pedestrians cannot be knocked down or run over, where there are no switching or trackage obstructions, no waiting at stations, no collisions, no missing of trains, no delays of any sort—it all sounds Utopian. And yet a glance at the plans and details of this continuous railway, affords seemingly abundant testimony as to its extreme simplicity and feasibility.

While never tested as to its value as a factor in every-day municipal affairs, the device has figured prominently in three great international expositions—Berlin, Paris and Chicago—and in all has carried more than twelve million persons without accident worthy of the name, without serious personal injury or loss of life, without crowding and without delay. This is considered a test not devoid of practical features. Although the system has never been adopted as a part of the transit improvements in the cities mentioned, it is explained that many of the improvements that have now been made were not then in existence; for instance, the increased speed facilities and the ability to make sharp turns. Six miles an hour, the maximum made at the expositions mentioned, could not recommend itself to those in search of adequate rapid transit; and then, too, the moving platform was regarded merely as a toy. Now the capacity for speed has been increased to ten or twelve miles an hour; another important improvement is an appliance which will enable the platform to turn the sharpest curve, such as that around a city block.

It is proposed that the subway through which the platform runs shall

be constructed of concrete, and outside the stations (one of which will occur on an average every other block) the subway will be divided into halves, one for the platform moving in one direction, the other for the platform moving in the opposite direction. The tunnel is to be thirty feet wide and fourteen feet high. Eight feet of this height will be above the platform level, and six feet will be below the platform, where the motive power is. This space will afford the workmen and inspectors headroom while moving about the mechanism. The moving platform consists of three continuous lines of steel plating, or to put it simply, three continuous lines of sidewalk. These three sidewalks overlap one another laterally at their sides. There is a fourth outside sidewalk which is designed merely as an emergency section to run in case of breakdown of the other platforms. The first platform being stationary the greater part of the time, the platform adjoining it will run at a rate of three miles an hour, the next at six miles an hour, and the next platform, the one with seats on it, will run at the rate of nine miles an hour constantly. The speed of all may be increased proportionately. The traveler steps from the stationary platform to the platform moving at the rate of three miles an hour, then to the six-mile platform, and thence to the main platform with seats, which moves at the rate of nine miles an hour. It is plain that to step from a stationary footing to a platform moving at this last named speed would upset the equilibrium of almost anyone, but even a tottering old woman can step from a stationary footing to a platform moving three miles an hour, and the other steps can be made with equal ease. By the same device of graduated speed, alighting is made easy, and to further assist equilibrium, posts are placed in the stepping platforms at intervals.

The platforms will be built in sections, each being six feet long, the abutting ends being struck to a radius which will permit the turning of sharp curves with scarcely a break between the ends of the sections. Beneath each platform is a pair of I-beams, the upper flanges of which are riveted to the bottom of the platform, while the lower flanges support the weight of the platform upon pairs of wheels, which turn upon transverse shafts. These shafts, in turn, are mounted upon concrete piers placed at intervals of two feet nine inches. Between each pair of I beams the platform carries pairs of guide wheels, lying flat and engaging a guide rail running directly beneath the centre of the platform. This serves to keep the perfect alignment. At every seventy five feet, ten-horse-power motors are mounted on the floor of the subway, and are connected by chains with the transverse shafts. These shafts turn the wheels upon which the rails of the platform rests, and thus the propulsive power is obtained. The size of the wheels determines the speed at which the platform moves. For example, the wheels of the three-mile platform are eight inches in diameter; those of the six-mile platform sixteen inches in diameter, and those of the nine mile platform, twenty-four inches. The wheels on which the platform rails runs are covered with rubber, as are also the guide wheels, and consequently the movement is noiseless and smooth. The floors of the steel platforms are also covered with rubber, and thus the danger of slipping is reduced to a minimum.

It can be readily seen that a platform moving at the rate of nine or ten miles an hour would render congestion impossible. Such platforms are to all intents and purposes the continuance of a busy street on which great throngs move safely; yet such streets may be blocked by crowds, and the fact that the platform is moving would prevent blocking on this device.

As to the carrying capacity, it may be limited only by width and speed. At the rate of nine miles an hour, a moving platform fitted with seats holding two or three persons is capable of delivering 47,250 seated passengers per hour. The capacity of the four-track section of the subway, using eight-car express trains every two minutes and five-car local trains every minute, is 25,000 seated passengers in one direction every hour. If the moving platform should do what is claimed for it, it would exceed the Subway service nearly 70 per cent in point of capacity, and this does not include the persons walking or standing on the various platforms. Again, at the height of the present crush on the Brooklyn Bridge, the crowd of homeward bound Brooklynites numbers 54,000 an hour; and it will be seen that with a slight increase in speed, the platforms could easily cope with the throngs.

The great problem of transit in modern times is to combine light weight, speed and carrying capacity. It would seem that the moving platform would provide the solution: for there are no engines or heavy motors necessary; rolling stock consists of the platform itself; collisions are impossible; motormen and conductors are not required, and a continuous motion which eats up time and space to a degree which can hardly be appreciated by the unthinking, is secured.

#### Preserving Spiders' Webs.

The web of the spider has always been regarded as one of the most delicate and perishable objects in nature, and it will surprise most people to learn that it can be preserved. The web is so interesting in itself, and each one is so characteristic of the particular species to which its maker belongs, that its study is one of the most fascinating of natural history pursuits. The difficulty of continued and general observation of these objects is about to disappear, as a method has been found by which they can be easily and permanently kept for future study or display. The idea presented itself to a photographer who was spraying webs in order to obtain reproductions with his camera, and he has since used it successfully.

The web to be preserved is sprayed with artist's shellac from an atomizer, in much the same way that crayon drawings are fixed, and immediately a clean glass plate is pressed against it. At the same time, the supporting strands are carefully broken so that the web, which will stick to the glass, is freed from its former surroundings. Since every strand of the web is covered with minute droplets of shellac, they are rendered plainly visible, and, furthermore, they adhere very tightly to the glass. In a short time the shellac will thoroughly dry and the plates holding the webs can be filed away in a cabinet or hung up for display. If desired, the web may be protected by covering it with another glass plate in the way that the film of a lantern slide is protected, but this is not usually necessary.

The above directions apply particularly to flat webs, but with a little ingenuity almost any spider's web can be preserved in its natural form. For instance, a dome-shaped web was mounted thus: A branch twig was cut, stripped of its leaves, placed in an upright position. Several female spiders of this particular species were placed upon it one evening, and next morning there was a perfect dome, needing only to be sprayed with shellac and set away. Various methods of using these webs for purposes of ornament, now that they can be preserved, will suggest themselves to the mind.



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 Grinding machine..... H. A. Higbee  
 Grip..... J. Dunbar  
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 Hammock suspension support..... F. E. Schmidt  
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 Harrow..... A. Friedemann  
 Harrow..... N. C. Allen  
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 Hay and straw puller..... S. Ray  
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 Hub. Wheel..... O. Lundin  
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 Initiation apparatus..... J. M. Seibert  
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 Key fastener..... L. A. Foster  
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 Mine gate..... O. K. Bowman  
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 Speed increasing device. Automatic..... G. Baehr  
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 Train despatcher's order box..... D. O. Stinson  
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Drawer and the like. Sheet metal I. H. Athey  
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Drawing roll..... I. H. Athey  
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Drinking fountain..... W. H. Froggatt Jr  
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Easel..... H. A. Bernthsen  
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Hammer. Drop..... E. W. Merrill, Jr  
Hand wheel..... H. J. Wiegand  
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Headlight. Adjustable..... F. C. Lyon  
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Lamp. Incandescent electric, H. C. Parker  
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Liquid distributor..... L. Perotti  
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Wagon brake..... C. H. Gober  
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Water tempering and measuring system..... F. M. Peters  
Water heating boiler..... C. H. Meyers et al  
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Clock frame..... S. M. Lawson  
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Hook, Bath room..... A. N. Lattin  
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Range, Cooking..... F. J. Frey  
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Spoons, forks or similar articles, Handle for..... 2 pats. J. Chulee  
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Bath tub..... E. H. Sloman  
Batteries, Gas separator for storage..... T. A. Edison  
Batteries, Treating alkaline storage..... T. A. Edison  
Bean shooter..... J. H. Curry

Battery filling apparatus, Storage..... T. A. Edison  
Bearing, Ball..... 2 pats. R. Conrad  
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Bearing, Roller..... J. A. Perkins  
Bearing, Vertical shaft..... E. W. Bromall  
Bed attachment..... J. P. Williams  
Bed, Invalid..... G. Harden  
Bed warmer of cooler..... C. C. Vaughn  
Bedstead..... E. Griffith et al  
Beet washing machine..... A. Magnin  
Belting, Antislippage dressing for..... B. E. Eldred  
Blast flame furnace..... J. B. Leonard  
Blotter holder..... E. M. Whittington  
Boats, Duct keel for submarine, L. Y. Spear  
Boats, Power transmission for explosive motor driven..... W. E. Collier  
Boiler cleansing compound..... J. Williams, Jr  
Boiler fire boxes, Superheater for G. D. Miller  
Boilers, Lantern and plug for water tube..... J. P. Prentice  
Book support..... J. C. Dana  
Bottle cap..... C. P. Byrnes  
Bottle closure..... C. H. Lyons  
Bottle making apparatus..... J. D. Cox  
Bottle, Non refillable..... H. Tolke et al  
Bottle, Non refillable..... D. Brummerhop  
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Bronzing machine..... M. Fritzsche  
Brush..... A. L. Sonn  
Brush..... I. P. Wiens  
Brush and door closer, Automatic fly..... A. Miller  
Brush, Fountain paint..... G. Meyer et al  
Buckle..... L. Sanders  
Buckle, Cross line..... C. A. Baker  
Bulging machine..... A. W. Rogers  
Buggy boot and fastener..... P. J. Blaser  
Buggy storm front..... J. A. Wilson  
Buggy, Top..... J. Morris  
Buggy top support..... W. N. Stroud  
Burglar alarm..... A. M. Andersen et al  
Bushing..... C. A. Widner  
Button, Collar..... C. C. Figgatt  
Calking machine..... C. Youngstrom  
Can..... J. F. Ross  
Can body making machines, Automatic blank feed for..... P. Foss  
Can heading machine..... I. Brenzinger  
Canceling tool..... W. E. Bowersock  
Car body holsters, Combined brace and draw bar pocket for..... H. M. Pfleger  
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Car brake operating mechanism..... E. I. Dodds  
Car coupling..... C. Dietz  
Car coupling..... W. McConway, Jr  
Car, Dumping..... J. Knittel  
Car, Motor..... M. Ehrét  
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Cement building block..... G. W. Roberts  
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Channel pin..... R. W. Vogel  
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Chisel, Stone cutter's..... J. W. Fox  
Chuck..... 3 pats. P. A. Whitney et al  
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Cloth guiding device..... E. Van Winkle  
Clutch and counter shaft mechanism..... B. T. Burchardi et al  
Clutch, Friction..... G. E. Turner  
Clutch mechanism..... E. E. Wright  
Collar, Horse..... H. A. Fontaine  
Collar supporter..... J. H. Theberath  
Concrete, Apparatus for forming artificial stone building blocks from..... A. A. Pauly  
Concrete block machine..... T. C. Holt  
Concrete construction form..... H. W. Hathaway  
Concrete metal construction, Tubular..... W. C. Hooper et al  
Concrete mixer..... J. Dorweiler  
Concrete post mold..... L. A. Pratt  
Concrete sewer construction, Form for..... R. J. Paul et al  
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Controlling apparatus..... W. J. Richards  
Corn husker..... R. G. Rate  
Corn husking machine..... W. G. Conover  
Corn shock blinder..... J. C. Crosin  
Corpses, Device for handling..... G. E. Kidd  
Cotton chopper..... S. B. Muirheid  
Crate, Carrier..... F. L. Wetzel  
Cultivator..... J. P. Hill  
Cultivator, Gang..... C. Bjorklund  
Current regulator..... W. K. Gibboney  
Currents, Generating alternating W. Stanley  
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Dish washing machine..... A. W. Boell  
Disinfecting apparatus..... 2 pats. W. H. Rose  
Door closer and check..... W. H. Henry  
Door construction, Sliding..... J. R. Hussey  
Door hanger..... P. M. Elliott

Continued in July Number.

## Canadian Patents.

Canadian Patents may now be obtained by the inventors for any of the mechanical inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated, the cost will be a little more. For full instructions address Inventive Age Publishing Co., 918 F Street N. W., Washington, D. C.  
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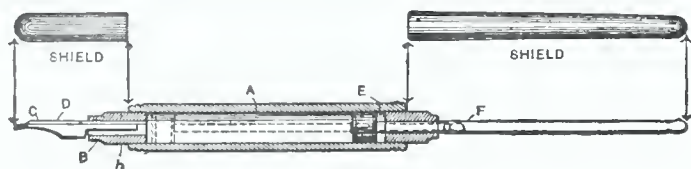


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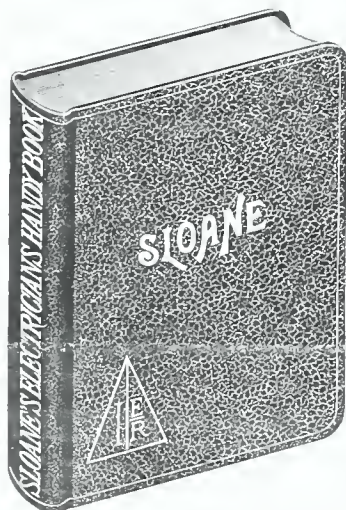
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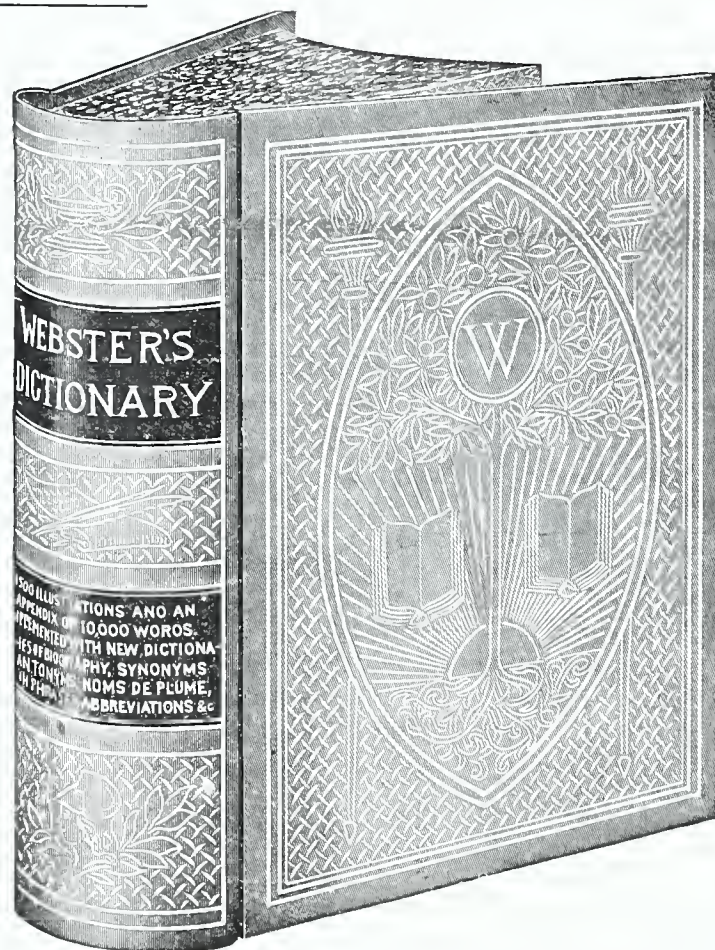
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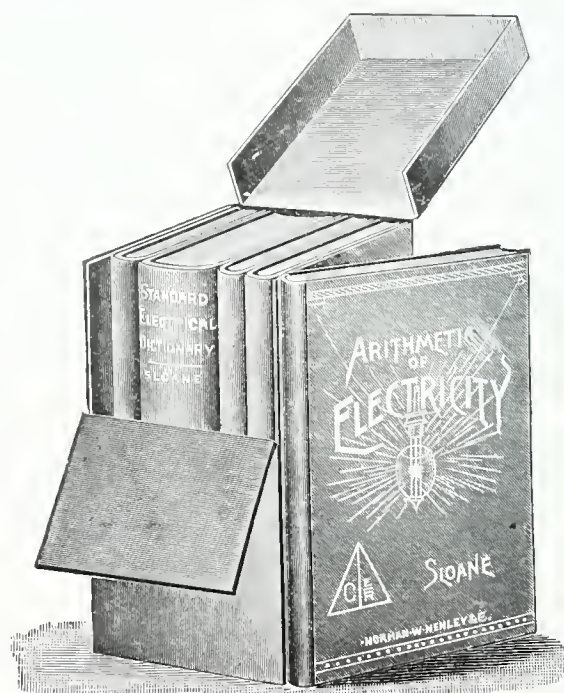
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EIGHTEENTH YEAR. }  
No. 7.

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## THE TRIUMPHANT TROLLEY.

THE steam railway finds a competitor not only in the automobile, but in the trolley. Residents of the East, where legislatures have been "influenced" in every possible way for the benefit of the railways, do not realize the growth of the electric system in the middle West. During the continuance of the Louisiana Purchase Exposition, cheap trolley excursion tickets were sold everywhere in Ohio, good over connecting steam and electric railways to St. Louis. Since last summer, a practically all-trolley route has been completed from Western New York and Pennsylvania to the Mississippi and beyond, while the ever-advancing network of electric roads is stretching rapidly toward the Rockies. In fact, today a continuous trolley trip from Maine to Missouri is practical but for a gap in Central New York that is being swiftly closed; and when plans now under way are carried out, one can ride by continuous trolley from Portland on the Atlantic to Portland on the Pacific.

The level prairies of the West lend themselves to trolley construction, and the farmers have demanded legislation that favored the electric roads, with the result that there are more miles of interurban trolley in the state of Ohio than in all New England, while Indiana, Michigan and Illinois are building many more miles of electric than of steam railway, and even Nebraska demands the construction of a network of interurban trolley lines. The state of Washington has sent an electric road from Spokane across Idaho to Western Montana. From Puget Sound and the Pacific Coast the melting snows of the mountains provide boundless power that is sending trolley cars spinning eastward, so that despite all opposition, we may soon expect the transcontinental electric railway.

To Cleveland, Ohio, belongs the credit of popularizing the trolley in America. Cleveland capital is behind almost every interurban electric railway project of any magnitude in this country. From Cleveland the trolley began to radiate in every direction, until there were nearly five thousand

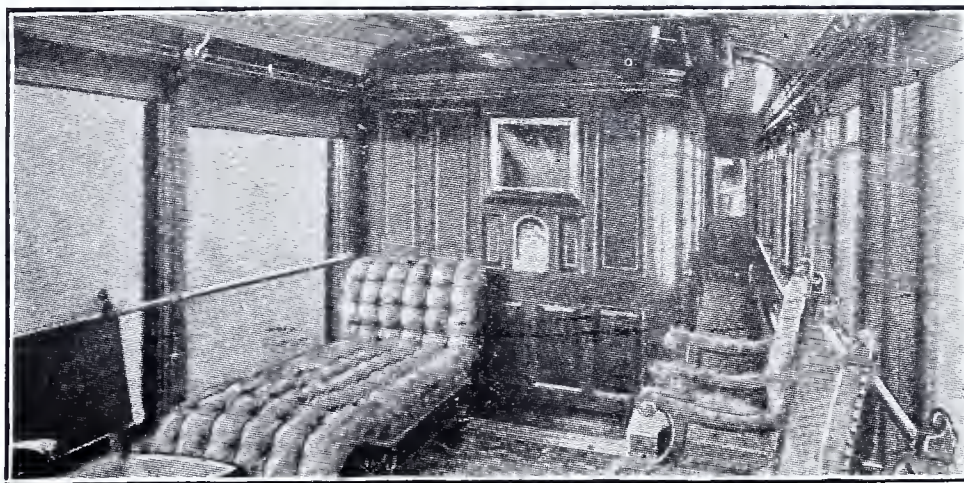
miles of electric railway in Ohio, and the lines had begun to lap over into Canada. As the various systems became connected, the interstate roads

organization to improve the service. Not content with having captured the short haul business, the capitalists behind this new octopus are reaching

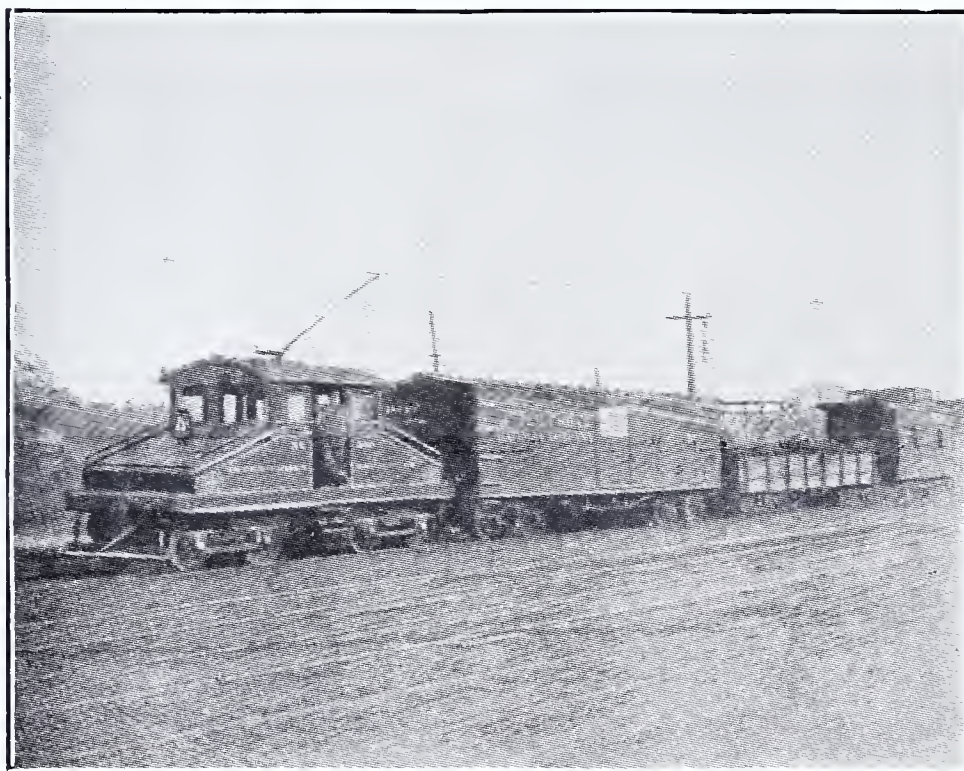
interrupted runs of three and four hundred miles are made both in Ohio and Indiana.

The pioneer long distance trolley express was that between Cleveland and Toledo. It has been so successful that it now has to run two cars instead of one on each of its three daily trips, and soon the number of runs will be doubled. Already the run has been extended to Detroit. The cars are luxuriously equipped with arm chairs and commodious sofas. The trunks are stowed in the baggage compartment, and there is a buffet for the convenience of the passengers. Sleeping cars have been introduced on some of the lines, and as these have the advantage of gliding along more smoothly than do their rivals of the steam road, with no smoke and less noise, they are attracting the bulk of the passenger traffic.

The fastest interurban trolley service in the world, for a long distance run, is that between Lima and Dayton, Ohio; for eighty miles the trolley express keeps pace with the locomotive on the parallel steam road, and arrives at its destination on time more frequently than does the other. As it costs less to operate an express than a local trolley car, and the receipts are usually much higher, excess fare is seldom charged on the electric railways, and where there is active competition with the steam railway, the trolley express has placed through tickets on sale at less than half a cent a mile. Throughout the Middle West, a cent and a half by trolley against three cents per mile by steam road is the usual rate. Some of the express trains maintain a continuous speed of 65 miles an hour; but twenty-eight is the present average speed of the interurban trolley. Nevertheless, on account of frequent connections, better time may often be made by the electric than by the steam road. For instance, from Akron, Ohio, to Kalamazoo, Mich., is 365 miles by trolley, yet the distance can be covered more quickly than by steam, at a cost of \$5.45 for the trip against \$8.07 behind the locomotive. From Indianapolis, Ind., to Zanesville, Ohio, it is just



LOUNGING ROOM, INTERIOR OF A PASSENGER COACH.



FREIGHT TRAIN.

came into existence, with the result that the different managements combined to fight their common enemy, the steam railway, issued interchangeable mileage books, and perfected an

out for more ambitious things. There has been lately introduced the electric flier, fitted up with all the luxury of a Pullman, that makes through trips between the larger cities. Today un-



250 miles, yet an hour's time may be saved by taking the trolley in preference to the steam car. Nor is it only the long distance passenger traffic that the triumphant trolley hopes to snatch from the steam railways.

Finding that the short freight haul was its least lucrative business, many of the railways in the Middle West yielded this traffic to the competing electric lines. The farmer who previously drove his milk and produce to some distant railway station, now reins up his horses anywhere along the line of the trolley, careless as to whether or not he reaches his destination at any given hour, as he knows that a car must soon come along, and then all that he has to do is to wave his hand, pull out one through ticket for each can of milk or sack of produce he wishes to ship as "passengers" to town, and tell the conductor where to put them off. It is obvious that with such a system in operation, it was hopeless for the railways to compete for small freight within thirty miles of a city. Recently the trolley has also gone into the mail and express business, and here again the revenue of the railway is made to suffer.

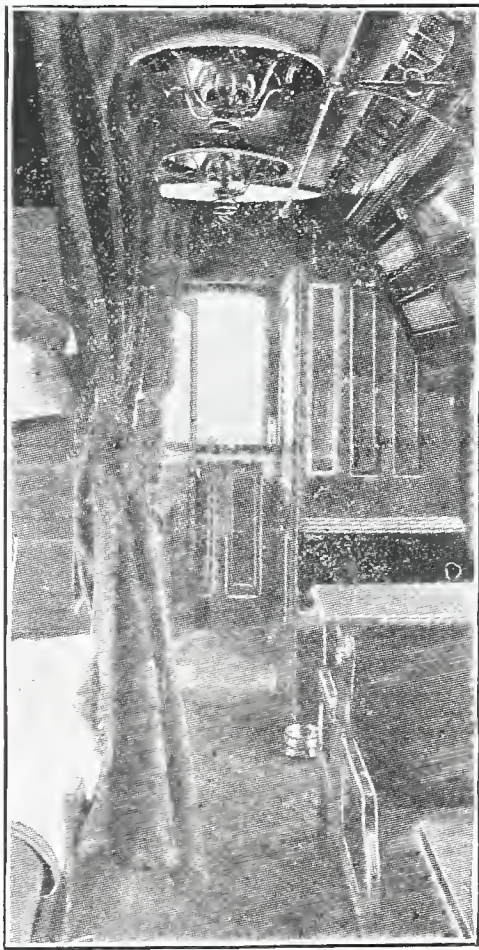
The interurban trolley can live and thrive with only its passenger service as a source of revenue, while to many steam roads the passenger service is a source of actual loss. For a sum that it costs a steam road to run a train every hour, the electric line can send out a car every four minutes; moreover, the trolley has its terminals wherever a passenger wishes to alight. Every house that is built along a suburban line is worth \$30 annually to the company in added fares. A trolley that has never returned a dividend may be turned into a paying property by the mere construction of an amusement resort at its farther terminal. In a hundred ways, the company may thus build up a remunerative clientele.

As already noted, the trolley has made relatively little progress in the East. In New England, its powerful rival has succeeded in having laws passed forbidding the electric road to carry freight and express, limiting its speed, and hampering it in many ways. The railways have even found it necessary, in some cases, to purchase entire competing trolley routes, so that the electric lines from city to city between New York and Boston have been rendered of little service as a through route because of the arrangement of its schedule to take 21 hours to cover 250 miles,—a trip that would be made in eight hours in the West. In New York state the outlook is more hopeful, for the subversion of Niagara is creating a revolution in electric methods. A trolley line is being stretched rapidly across the state, a trans-New York road will adopt the overhead wire, another will use the third rail, while the New York Central is experimenting with the most powerful electric locomotives ever constructed. These have proved themselves capable of hauling heavier loads at a greater speed than can their steam competitors.

New York and Philadelphia are already connected by trolley, and

through cars run at frequent intervals—not, however, at the rate of speed that would be demanded in the West. Through express cars that should easily make the eighty-odd miles in three hours consume thrice that time. But with the completion of the tunnels under the Hudson and beneath the Delaware, we are promised through trolley cars from any part of Manhattan to Broad Street, Philadelphia, in little more time than it now takes the steam locomotive to cover the same distance. The present through trolley rate of \$1.50 will be lowered to \$1 each way, and a car will leave either terminus every five minutes. Philadelphia and Washington will soon be connected in the same way, and Pittsburg is also sending an electric road toward the National Capital.

A long distance journey by trolley is a fascinating mode of travel, and is becoming more and more popular for tourists. It affords an excellent opportunity to study the scenery, and is much more comfortable than a trip by railway, avoiding, as it does, the jarring and smoke. To be able to retire in a berth at bedtime abroad a trolley at Indianapolis and alight



SLEEPING CAR SHOWING BERTH.

immediately after breakfast at Cleveland or Detroit, is a possibility of today not dreamed of at the beginning of our still very new century.

Although in time the real "electric flyer" will have its day, at present it is the purely practical and useful that interests the American inventors who have spent four billion dollars in building electric railways, as against twelve billion it has cost to build and equip our steam roads. So far no wonderful spurts of speed have been made with the trolley in this country, but in Germany it has been demonstrated by actual government tests that with heavy cars and perfect road-bed, a speed of 125 miles an hour may be maintained with perfect safety, while 80 miles is the limit set for safe traveling over ordinary tracks where lighter cars are used. By the time the trans continental trolley, now in sight, is completed, it is safe to predict that the speed records for long distance traveling will be held by the electric railway. Meanwhile, the trolley lines are rapidly spreading over the continent as the most convenient form of locomotion yet devised for the use of men.

## SAVING LIFE IN MINES.

The common form of farewell among miners in Germany is, in a liberal translation, "May you return again to the light of day." There could be no more graphic illustration of the dangers that attend the mining industry. The earth may cave in, water may flood the works, an isolated miner may easily lose his way in the labyrinth of passages; greatest peril of all, a chance explosion may fill the mine with poisonous gases, from which there is no escape. The constant striving to increase the output and at the same time to lessen the cost of production of mines intensifies the risk. It is true that every possible precaution is taken to minimize the opportunities for catastrophes. Rescue stations have been established, and in the largest and best conducted works, a trained rescued corps is constantly held in readiness for emergencies, prepared, like firemen, to rush forth at the first hint of danger. Devices of various kinds are employed to combat the enemy, one of which was an electric signal system described in the October number of the INVENTIVE AGE. Among the most useful inventions in this line are those which attempt to eliminate the risk resulting from gas; and a recent device is based upon the principle of producing the oxygen required for breathing by means of the exhalation products themselves. These products—carbonic dioxide and vapor of water—are filtered through a porous layer of sodium-potassium peroxide, which absorbs the exhalations.

There are two types of this apparatus, one for continual use while at work, and another for use in the moment of danger. The first type will permit a man to breathe in any irrespirable atmosphere for about one hour, thus giving any miner time to save himself from suffocation. The apparatus consists of a frame provided with a hose, mouth-piece, and a bag sufficiently large to hold a box which contains the layer of sodium potassium, together with the necessary filters.

The second type is designed to permit a man to breathe for a period of about an hour and a half, 60 minutes being counted for work and 30 for retreat from the locality filled with dangerous gas. It consists of three boxes supported in a frame, each containing the same amount of sodium potassium peroxide as in the type first described. There is a large bag made in the form of a jacket, which permits the bearer to conveniently find his way through the narrowest passages to safety. The device will be better understood by reference to the illustrations, Figure 1 of which shows the apparatus of the second type adjusted in position for use, and Figure 2 the component parts of the first type. The cylinder made of tin, which contains the filtering medium, is shown in Figure 2 both adjusted in its framework and separated therefrom, as seen at *O*. *H* is the jacket-bag; *A* the tube that leads to the mouth, and *M*

the mouthpiece. The entire apparatus is enclosed when ready for use in an insulating covering *J*, which consists of two braided pasteboard cylinders. At the bottom of the framework which supports the cylinder is located a dust collecting chamber.

The apparatus, which may be deposited either in a hanging or lying position, must be prepared before hand ready for use. The boxes (of the second type or device) should be placed in the supporting frame within the insulating covering in such a position that the sheet lead plates at the top and bottom are in contact with perforated crowns that serve to hold them in place. Care should be taken that the boxes are in proper position—that is, the tube-connecting joint uppermost, and the bag-connecting joint lowermost. When the apparatus



FIG. 1.

is ready for use, the jacket is placed upon the body with the unperforated side of the insulating covering toward the breast, the supporting frame being hung on the neck and locked in position by a leather waist-band fastened by an aluminum buckle. Care must be taken that all the joints are screwed tight. The bag is then filled through the mouth piece with about eight quarts of oxygen. This may be generated in the producer, by means of the reaction of water upon the sodium potassium peroxide; or it may be pumped in by any steel cylinder containing oxygen arranged for the purpose. Where large rescuing parties are equipped with such apparatus, steel cylinders are often employed for the reason that it enables a large reserve of oxygen to be held ready for instant use. The mouth-piece is then inserted between the lips and teeth, and the nose clamp adjusted, as represented in Figure 2.

During the time a miner is at work,



breathing takes place simultaneously through two boxes. The third box is kept reserved for the retreat. When the first two boxes have been exhausted, (notice of which is given by the high resistance offered to breathing) and the miner is still in the locality filled with irrespirable gases, the third box can be switched into action by pressing a small handle

after removing the screw cap. Then the tubes carrying the perforated crowns, which are merely fitted into the transverse tubes and may be readily removed, are cleaned by vigorously blowing through them. Finally the parts of the apparatus are put together and locked in position, whereupon it may be recharged in the manner already described and

until the apparatus has become warm, whereupon moderate motion such as walking, ascending ladders or stairs, etc., can be attempted. It is claimed that a man, with the aid of this device, can breathe about 100 minutes when he keeps quiet, and 30 or 40 when he is in motion. It is calculated that a man can walk a distance of a mile and a quarter in that time.

The apparatus can be cleaned and recharged by carefully removing the box or cylinder from the framework, so that the top and bottom will not be injured. The dust collecting chamber at the bottom of the framework, to which the bag is attached, must be carefully cleaned from any carbonate particles that may have entered into the same. This is done by unscrewing nuts. The cleaning must always be done when the apparatus is

dry, the bottom of the dustcollecting chamber being firmly screwed back into place, so that the apparatus will be perfectly air tight. In re-adjusting the cylinder, care must be taken to bring it accurately into position.

The device can be kept in reserve for years, only requiring an examination from time to time in order to see if the different rubber parts are in

good condition, and that the lead plates which hermetically close the cylinder are not injured. It may be readily seen how valuable such an apparatus would be, in combating the perils that lurk in darkness.

#### More Prizes Offered by France.

Consul-General Skinner, Marseilles, writes that the official decree has been published by the President of the French Republic providing for prizes for the following described inventions.

One prize of 20,000 francs (\$3,860) is instituted for the benefit of the person who shall discover a denaturalizing agent for alcohol more advantageous than the denaturalization now in use, and offering to the "treasury" every guarantee against fraud.

One prize of 50,000 francs (\$9,650) is provided for the benefit of the person who shall discover a system of utilizing alcohol for illuminating purposes under the same conditions as petroleum.

The commission of analytical methods and of alcohol denaturalization instituted within the ministry of finance by the decree of June 23, 1896, is instructed to determine the conditions under which these prizes shall be distributed, and to award them in conformity with the programme which it shall lay down.

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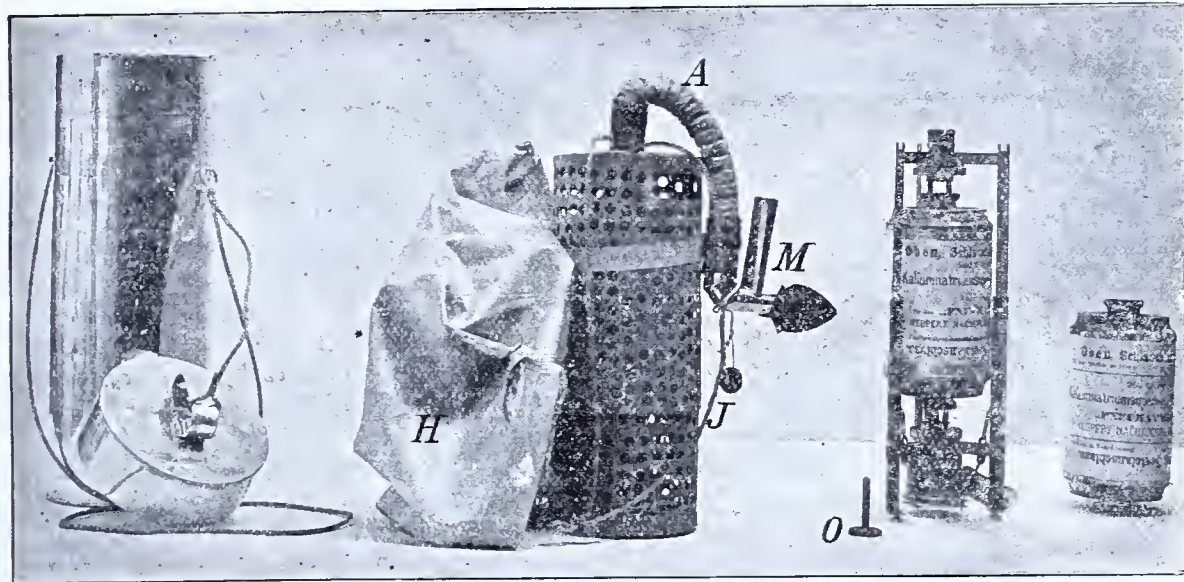


FIG. 2.

attached to the apparatus. The third box can maintain breathing for about an hour. The apparatus may be recharged by removing the exhausted boxes, cleaning the upper and lower transverse tube, and wiping out any carbonate particles adhering thereto. The lower transverse tube should also be cleaned carefully in its interior by means of a metal brush,

kept on hand for use.

The apparatus of the first type works in a similar manner. When taken from its case for use, the bag is filled by vigorously blowing into the mouthpiece, after which it is placed between the lips and a clamp adjusted to the nose. During the first three minutes breathing, either sitting or standing, one should keep quiet

#### THE BORAX INDUSTRY.

There are few better illustrations of the indomitable energy of mankind than the fact that a flourishing industry has been located on a spot that is one of the most inimical to human life on the surface of the globe. The desert tract in California, appropriately known as Death Valley, is

for the summer temperature is frequently 135 degrees in the shade; and by the time that point is reached, few there be who care to learn what the thermometer is capable of in the sun. Yet this spot where no living thing can thrive, where even the hardy desert plants are vanquished, is the home of that indispensable article known as borax.

face of these difficulties, the borax works were undertaken. Lumber and supplies were drawn across the weary waste, and houses and works laboriously erected. The hauling of the borax to market is done by a team of twenty mules (see illustration). The wagons used each contain ten tons, and two of these wagons, holding a car load of borax, with a big water

manite in a bedded deposit from 5 to 30 feet thick. The refined product reaches the market in the form of prismatic sodium borate, or borax, and boric acid. There is another variety called octahedral borax, which differs from the common variety in that it contains five molecules of water of crystallization, and is octahedral in form. The prismatic borax remains unaffected in transparency by exposure to the air, but the octahedral variety rapidly becomes opaque, and, absorbing five equivalents of water, is converted into the prismatic salt.

The uses of borax are so numerous that it has been called a sort of wizard among minerals. It is most generally known as a cleansing agent, and for softening water for the toilet or bath; but it is also useful in metallurgy or pottery, as a preservative of meats and fruits, a purifier of drain pipes, sinks, etc., as an insecticide, and in a variety of other ways. It is little wonder that the output of this product of the desert has in thirty years increased from 1,000 tons a year to 12,000.

#### A Mechanical Prophet.

In Washington, D. C., there is a prophet not without honor in its own country. We say "its," for this wonder has neither intelligence nor feeling, but is purely a mechanical contrivance, the invention of Prof. Wm. Ferrell, who presented it to the Government. It does the work of forty expert computers, and is used by the Coast Survey to predict the times of high and low tide a year or more in advance. On its work, which is done with great accuracy, are based the tidal tables annually issued by the Survey.



famous for the number of casualties that have occurred within its boundaries. Every year adds to the list of travelers who have perished in its intolerable heat. Probably the foot of man has never trodden on ground so far below sea level; so near the fiery bowels of the earth. This indeed seems the crust above those caloric regions,

Some twenty-five years ago deposits were found in this deep valley. The nearest base of supplies was San Bernardino, 250 miles away. In all that dreary trip across the sandy Mojave desert, one came upon scarcely a single spring, and the route led over one of the most precipitous of mountain ranges in the world. In the

wagon in tow, are drawn by the team. The latter, some forty yards long from leader to wagon, is guided by a single rein, called the jerk line, 120 feet long and requiring peculiar skill on the part of the driver.

The ore, which occurs in large masses more or less connected by bands, consists of the mineral cele-



# CLEVER NEW PATENTS.

NAILLESS HORSESHOE.—FIREARM.—WELL JACK.

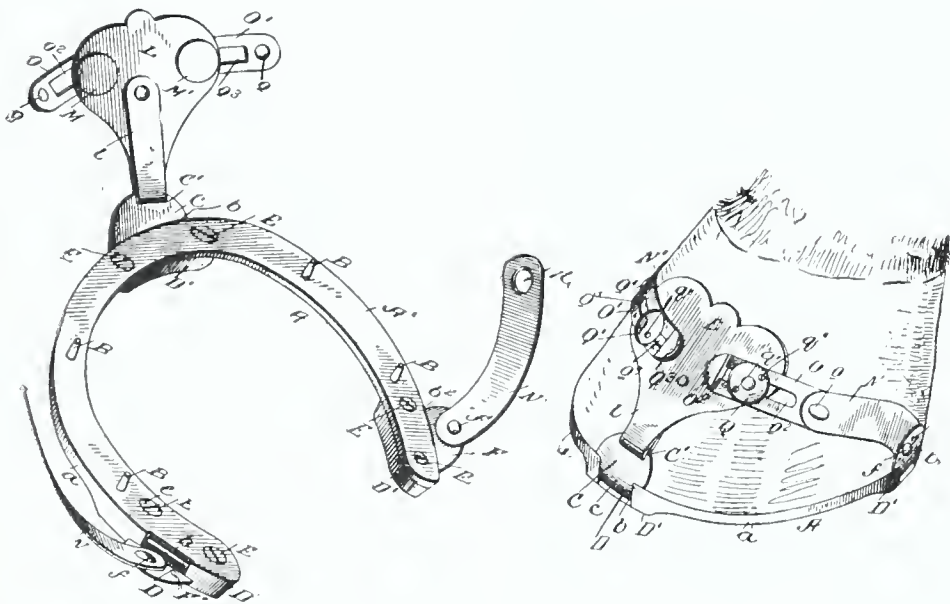
## Nailless Horseshoe.

A distinctly novel type of nailless horseshoe has been devised by Mr. Chas. W. Crannell, of Rocky Ford, Colorado, and the patent obtained thereon is now controlled by The American Nailless Horseshoe Company, of Colorado.

The object of the invention is to provide a shoe of this character in which the clamping members for holding the shoe on the hoof are over the thickest part of the shell thereof, while in the ordinary nailless and nail-shoe the holding means is in or over the thinner part of the shell of the hoof, and therefore does not hold as well, and causes the feet of the horse to become tender.

Another object of the invention is to provide a shoe which can be removed at will, and the calks or rubber tread may be readily replaced when they become worn, or it can also be used in connection with speedy horses when it is desired to increase or decrease the weight of the shoe, and this is accomplished by placing larger or smaller calks thereon. The said calks serve the twofold purpose of a calk and the means for holding the pivoted clamping members to the shoe.

A still further object of the invention is to provide a shoe of this character in which the hoof is allowed to have its natural expansion during motion.



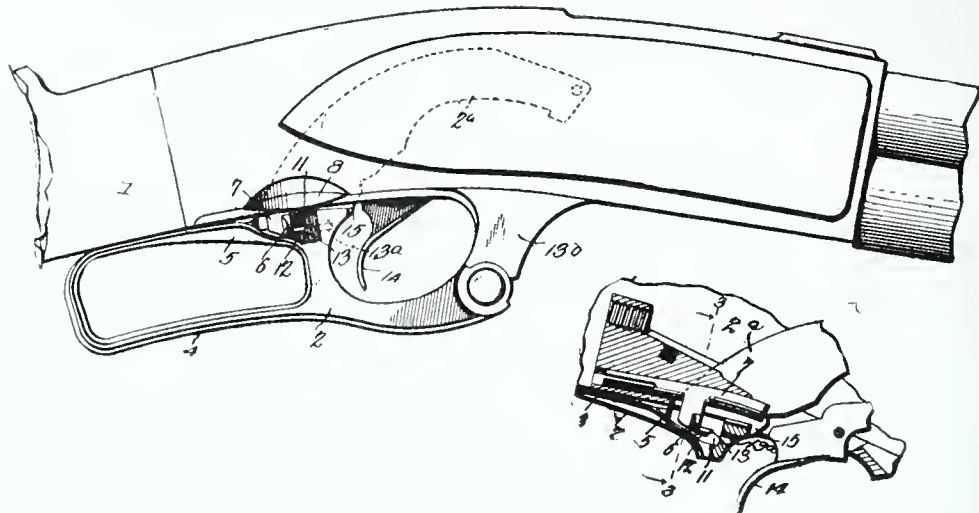
As shown in the accompanying illustration, the shoe proper, which may be of any suitable size, is provided with spurs *B* arranged to be driven into a hoof of the horse. Calks *D* are secured to the front and rear ends of the shoe. The front calk has a clamping plate *L* hinged thereto. Links *N* are pivoted to the rear calks, and have adjustable link connections *O* with the plate *L*. It will be evident by referring to the illustrations, that the shoe, as thus constructed, can be readily applied to the hoof, and is readily detached, the arrangement, moreover, being such that the holding means is over the thickest part of the shell of the hoof, so that it will not cause the animal's foot to become tender.

## Firearm.

On October 3, 1899, to A. W. Savage was granted a patent on a well-known type of rifle, and Mr. Frederick W. Brooks, of West Superior, Wisconsin has obtained a patent on an improvement relating more particularly to the operating lever and safety catch and trigger of the rifle patented by Savage. The principal object sought by Mr. Brooks is to provide ready, simple and thoroughly feasible means for obviating the accidental shifting of the safety catch, and thus the locking of the operating lever and the trigger against operation, resulting from the forward movement of the hand on the grip of the operating lever upon the recoil of the rifle, when fired. Another and important object is to so project the finger-hold of the trigger, that the same is brought into a more convenient position to be engaged by the forefinger of the user.

Referring to the drawings, 1 designates the frame or grip of the rifle, and 2 the operating-lever, provided with the usual curved arm *2a* for actuating the ejecting and breech-closing mechanism. The upper member 3 of the loop 4 of the operating-lever, is provided near its front end and on its right-hand side with a safety-catch guard 5, which projects laterally a sufficient distance to cover the operating-knob 6 of the safety-catch 7, the latter operating to lock the trigger and operating-lever against operation when so desired.

The safety-catch 7 is provided with a pin 12, which is designed to engage with an orifice 13a in the operating-lever to lock it, the forward end of the safety-catch at the same time passing back of the trigger and locking it against operation, and to prevent interference between the said pin and the operating-lever, the end of the pin is beveled or cut away, as at 13.



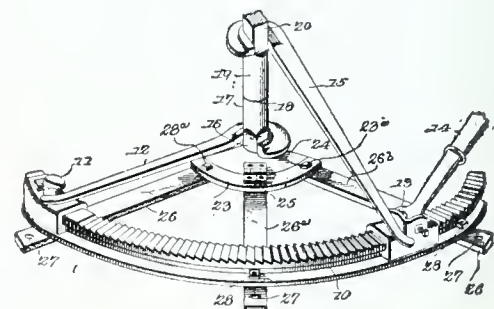
The finger hold 14 of the trigger is projected laterally out of the path of movement of the curved arm *2a* of the lever 4, and by this arrangement the finger-hold may be formed on a much longer curve and project closer to the rear wall of the trigger-guard, and thus be within more convenient reach of the finger of the user. To obviate any possibility of interference between the finger-hold and the operating-lever, the latter is cut away or recessed, as at 15, thereby to clear the terminal of the trigger.

## Well Jack.

In operating an ordinary oil well jack, the lateral strain or pressure is frequently so great that damage results to the piping or other parts of the valves, unless this lateral strain is prevented by employing temporary stays or braces. Mr. William E. A. Pipher, of Parker's Landing, Pa., has, however, devised a well jack which will dispense with the necessity of temporary braces, and he has assigned a one-third interest of the patent obtained thereon to William G. McGlaughlin and John H. Pipher, of the same place.

The invention relates to apparatus for coupling and uncoupling the sections of drill-rods and other parts of oil and Artesian wells or for similar purposes, and has for its object to improve the construction and provide a simply-constructed apparatus of increased efficiency and durability, and which in use will not injure the well casing or other parts of the well-drilling apparatus. The ordinary rack 10, with the stop 11 and the step-by-step lever mechanism 13 and 14, is employed. Secured to the rack are the outer ends of radially disposed adjustable braces 26, 26a and

26b, these braces carrying at their inner ends a curved plate 23, to which is hinged an inner member 24, the latter having a recess to engage the drill rod below the squared portion 16. As will be seen, the employment of the ordinary platform for holding it properly positioned with relation to the drill-rod or well-casing is rendered unnecessary, as all lateral strain is absorbed by the braces 26, 26a and 26b and the thrust-bearing formed by the members 23 and 24. In other



words, the strains are centered. By dispensing with the employment of a platform, not only is considerable expense saved in the operation of the apparatus, but its movement from point to point is facilitated, and the time required to set it up for operation measurably decreased.

## PATENTS, CAVEATS, TRADE-MARKS, COPYRIGHTS, AND DESIGNS. TWENTY-FIVE YEARS PRACTICE.

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## LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

### SIMMONS MFG. CO. v. SOUTHERN SPRING BED CO. et al.

(Circuit Court of Appeals, Fifth Circuit.  
140 F. R. p. 606.)

#### PATENTS—INFRINGEMENT—SPRING BED.

The Gail patent, No. 639,222, for improvements in spring bed and seat bottoms, conceding it to disclose patentable invention, is for an improvement merely in an existing and well-advanced art, by a new and slightly different combination of old elements, and is entitled only to a narrow and strict construction, limiting it to the exact device shown. As so construed, it is not infringed by the device of Haas & Crow patent, No. 745,345.

### LEADAM et al. v. RINGGOLD & CO. et al.

(Circuit Court, S. D. New York. 140 F. R. p. 611.)

#### 1. PATENTS—SUIT FOR INFRINGEMENT—EFFECT OF CHANGE OF OWNERSHIP.

A court of equity, which has acquired jurisdiction of a suit by the owner of a patent to enjoin its infringement and to recover damages for past infringement, does not lose such jurisdiction because, pending the suit, the patent is assigned to another, who is brought in by a supplemental bill under equity rule 57, and may proceed, not only to grant an injunction, but to award damages to both the original complainant and his assignee for infringement proved during the time of their respective ownership.

#### 2. SAME—INFRINGEMENT—BOOTTREE.

The Leadam patent, No. 621,423, for a boottree, was not anticipated, discloses invention, and is entitled to a fairly liberal construction; also held infringed.

### GOLDSMITH v. KOOPMAN et al.

#### REIZENSTEIN v. SAME.

(Circuit Court, S. D. New York. 140 F. R. p. 616.)

#### 1. PATENTS—ASSIGNMENTS—VALIDITY—CANCELLATION.

One of the complainants obtained patents for an invention in this country and Europe, and assigned a half interest in the foreign patents to the complainant in the second suit. They afterwards became associated in the ownership of the foreign patents with defendants and others, each complainant retaining a fourth interest. A fund was raised, and a representative sent to England, who negotiated profitable license contracts. This fact was concealed from the complainants, and, by means of representations to them that the efforts had so far been unsuccessful, and demands for further advances, at a time when large payments had been actually received under the foreign licenses, they were induced to transfer their property interests to defendants for a small sum. Held, that such facts constituted a fraud upon complainants, which entitled each of them to a cancellation of his assignment, and to recover his share of the profits realized from the joint venture, with interest.

#### 2. FRAUD—RECOVERY OF DAMAGES—PERSONS LIABLE.

A defendant who was an active participant in a scheme by which complainants, with whom he was in close and confidential business relations, were fraudulently induced to make a transfer of their property, cannot escape liability to make restitution on a cancellation of the transfer, on the ground that he did not himself profit by the fraud.

### CAPEWELL HORSE NAIL CO. v. PUTNAM NAIL CO.

(Circuit Court, D. Massachusetts. 140 F. R. p. 670.)

#### 1. TRADE-MARKS—PATTERN ON ARTICLE OF MANUFACTURE.

Complainant was a manufacturer of horseshoe nails sold to the trade in cartons and boxes, and for a number of years had placed on the face of the head of one of its several brands of nails a common form of check pattern formed by the intersection of diagonal lines, and made by the die which formed the head. The president of complainant testified that the marking was adopted as an ornamentation, and as a distinguishing mark of complainant's make, but public attention was not called to it in the advertisements of complainant, nor upon its cartons or boxes which displayed

its registered trade-mark and other matters of information. Held, that the fact of such use alone did not constitute the marking a trade-mark, in the absence of clear proof that it was adopted and used as such, or that it had become associated in the mind of the public with complainant's make of nails.

#### 2. SAME—UNFAIR COMPETITION.

The stamping by defendant on one side of the head of horseshoe nails made by it of a diagonal check pattern in prior use by complainant did not constitute unfair competition, where the cartons and boxes in which the nails were sold were entirely unlike those used by complainant, and there was no attempt to deceive purchasers into buying the nails as those of complainant, and where it was further shown that the mark resulted from "knurling" one face of the die to secure its better operation.

### FOX et al. v. KNICKERBOCKER ENGRAVING CO.

(Circuit Court, S. D. New York. 140 F. R. p. 714.)

#### 1. PATENTS—SUIT FOR INFRINGEMENT—SUFFICIENCY OF BILL.

In a suit for infringement by an exclusive licensee, the failure of the bill to allege that the license includes the exclusive right to make the patented article may be cured by amendment, where the evidence shows a license to make, as well as to use and vend.

#### 2. CORPORATIONS—ALLEGATION OF INCORPORATION.

An allegation in a bill for infringement that complainant is a corporation duly organized under the laws of a state is sufficient, and need not be proved, unless denied by the answer.

#### 3. PATENTS—INFRINGEMENT—DAMAGES RECOVERABLE—PROFITS AND DAMAGES.

Both profits and damages are recoverable in a suit for infringement in a proper case.

### RAWSON & MORRISON MFG. CO. v. C. W. HUNT CO.

(Circuit Court, S. D. New York. 140 F. R. p. 716.)

#### PATENTS—VALIDITY OF REISSUE.

The Norris reissue patent, No. 12,085 (original No. 638,669), for a clutch mechanism, held void, as not authorized on account of any accident, inadvertence, or mistake in the original patent, and also because of laches in applying for the same.

### AMERICAN TYPE FOUNDERS' CO. v. DAMON & PEETS.

(Circuit Court, S. D. New York. 140 F. R. p. 715.)

#### PATENTS—DESIGNS—INVENTION.

The Kimball design patent, No. 36,905, for a design for a font of type, is void for lack of patentable invention, and because it shows no such peculiar configuration or ornamentation as to authorize a design patent.

### LAMONT, CORLISS & CO. v. HERSHEY.

(Circuit Court, M. D. Pennsylvania. 140 F. R. p. 763.)

#### 1. TRADE-MARKS AND TRADE NAMES—UNFAIR COMPETITION—GROUNDS FOR RELIEF.

To make out a case of unfair or fraudulent competition there must be an actual wrongful intent to deceive the public into the belief that the goods of the one party are the goods of the other, accompanied by such acts and devices as are likely to do so, or such duplication in form and dress of the one by the other as will produce a confusion calculated to bring this about, of which the party complained against is convicted of being willing to have the benefit.

#### 2. SAME—PRELIMINARY INJUNCTION.

On an application for a preliminary injunction against alleged unfair competition in the dress of goods, it should be clear that the complainant has an established and exclusive right to pack and dress his goods in the way he asserts, on which the defendant is deceptively trying to trade.

#### 3. SAME—DRESS OF CHOCOLATE.

The showing made of unfair competition, based on the alleged similarity in shape and style of packages and color and style of wrappers in which chocolate is put up for the market by complainants and defendant, respectively, held insufficient to warrant the granting of a preliminary injunction.

### G. & C. MERRIAM CO. v. UNITED DICTIONARY CO.

(Circuit Court, N. D. ILLINOIS, E. D. 140 F. R. p. 768.)

#### COPYRIGHTS—INFRINGEMENT—PERSONS ENTITLED TO SUE.

One who publishes a copyrighted book in

the United States, containing due notice of copyright, but who subsequently takes the plates from which it was printed, and which were made from type set in this country, to England, and there publishes from said plates another edition of the book, intentionally omitting therefrom the notice of American copyright, cannot maintain a suit for infringement of copyright against another who imports a copy of the English book and reproduces it in the United States; the foreign copy, lawfully imported, being in legal effect a publication made in this country without the copyright notice, within the meaning of Rev. St. § 4962 [U. S. Comp. St. 1901, p. 3411], which makes such publication a bar to a suit for infringement.

### COUCH BROS. et al. v. ALLEN MFG. CO. et al.

(Circuit Court of Appeals, Fifth Circuit. 140 F. R. p. 856.)

#### PATENTS—INFRINGEMENT—CASING FOR HORSE COLLARS.

The Couch patent, No. 699,151, for a casing for horse collars, construed, and held not infringed.

### VICTOR TALKING MACH. et al. v. AMERICAN GRAPHOPHONE CO.

(Circuit Court, S. D. New York. 140 F. R. p. 860.)

#### 1. PATENTS—SUIT FOR INFRINGEMENT—EQUITY JURISDICTION.

Where a bill alleging infringement of an unexpired patent demands damages and a permanent injunction, equity has jurisdiction.

#### 2. CONTRACTS—VALIDITY—OUSTING JURISDICTION OF COURTS.

A prior agreement, by which the parties to a suit for infringement of a patent agree on terms of settlement on condition that the patent is sustained, cannot deprive the court of jurisdiction to hear and determine the case.

#### 3. PATENTS—PRIOR PUBLIC USE.

The mere exhibition of an experimentally constructed machine by the inventor to an audience, accompanied by an explanation of the invention, no charge being made, is not such a public use as will defeat his right to a patent applied for more than two years afterwards.

#### 4. SAME—ABANDONMENT.

A patent is not invalidated by the fact that the invention claimed was described, but not claimed, in an earlier application by the patentee, on which a patent was issued after the one in suit, where it is apparent that there was no intention to abandon the invention to the public.

#### 5. SAME—BURDEN AND MEASURE OF PROOF.

The burden of proving abandonment of an invention to defeat a patent therefor rests upon the party alleging the same, and evidence is insufficient which rests on doubtful inferences.

#### 6. SAME—INFRINGEMENT—GRAMOPHONE.

The Berliner patent, No. 534,543, for improvements in talking machines, was not anticipated, and discloses patentable invention; nor is it invalidated by prior public use of the invention or abandonment. Claims 5 and 35 also held infringed.

### NEW ENGLAND MOTOR CO. v. B. F. STURTEVANT CO.

(Circuit Court, S. D. New York. 140 F. R. p. 866.)

#### 1. PATENTS—ANTICIPATION—INOPERATIVE DEVICE.

A patent cannot, as an anticipation, properly have applied to it from necessity more than it fairly shows, to make it an operative structure. What is required, and not so shown, is left for later inventors.

#### 2. SAME—INFRINGEMENT—ELECTRIC MOTOR FRAMES.

The Burke patent, No. 631,518, for an electric motor or generator, the essential feature of which is an armature cradle supported by the magnet frame and removably and reversibly attached thereto for the purpose of securing a permanently perfect alignment of the bearings and a machine which can be reversed and affixed to the ceiling when desired, without interfering with the adjustment of the armature, was not anticipated and discloses patentable invention; also held infringed.

#### 3. SAME—PRIOR INVENTION.

The Bliss patent, No. 669,574, for a dynamo-electric machine, considered, and held valid as against the claim of prior invention and use by another; also held infringed.

#### 4. SAME.

One who conceived an invention and ex-

ercised diligence in filing an application is entitled to a patent therefor, although it was first reduced to practice by another, to whom it was disclosed by the inventor.

### PENN. ELECTRICAL & MFG. CO. v. CONROY et al.

(Circuit Court, W. D. Pennsylvania. F. R. 140 p. 872.)

#### PATENTS—INFRINGEMENT—MIRRORS.

The Wright & Curry patent, No. 631,033, for a mirror, construed, and held not anticipated, valid, and infringed as to claims 3, 4, 5, and 6.

### GENERAL ELECTRIC CO. v. McLAREN.

(Circuit Court, D. New Jersey. 140 F. R. p. 876.)

#### 1. INJUNCTION—CONTEMPT PROCEEDINGS FOR VIOLATION—BURDEN AND MEASURE FOR PROOF.

The burden of proof to establish the violation of an injunction rests upon the complainant, and the defendant is entitled to the benefit of every reasonable doubt. The court should be convinced that its writ of injunction has been violated before it adjudges a defendant in contempt.

#### 2. PATENTS—VIOLATION OF INJUNCTION—EVIDENCE CONSTRUED.

Affidavits alleging that defendant had violated the injunction of the court restraining him from practicing the process of the Howell patent No. 726,293, and answering affidavits considered, and the evidence held insufficient to warrant an attachment for contempt.

### MARLIN FIREARMS CO. v. SPARKS.

(Circuit Court, D. Connecticut. 140 F. R. p. 879.)

#### PATENTS—INFRINGEMENT—MAGAZINE GUNS.

The Hepburn patent, No. 584,177, for a magazine gun, construed on motion for a preliminary injunction, and held infringed as to claims 1, 2, 3, 4, 7, and 8.

### SAXLEHNER v. EISNER et al.

(Circuit Court, S. D. New York. 140 F. R. p. 938.)

#### 1. TRADE-MARKS—SUIT FOR INFRINGEMENT JURISDICTION OF EQUITY.

The fact that the infringement of a trademark had ceased before the commencement of a suit in equity therefor, does not deprive the court of jurisdiction where the bill alleges a threatened and intended continuance of such infringement, which allegation was justified by the facts.

#### 2. SAME—INFRINGEMENT BY CORPORATION—LIABILITY OF EXECUTIVE OFFICERS.

The executive officers of a corporation, who were large stockholders, and had full management of its affairs, and instigated and controlled its action in willfully infringing complainant's trade-mark and simulating her labels, are jointly and severally liable with it for the infringement; and, where they directed and controlled its defense when sued therefor, the final decree in the suit is conclusive on them as to the matters adjudicated, including the damages found due complainant on an accounting, and a suit will lie against them to recover the amount of such decree from them individually, when, through their control and influence, they caused the corporation to transfer its property and to declare and pay dividends pending the suit against it, by which it was rendered insolvent.

### AMERICAN GRAPHOPHONE CO. v. LEEDS & CATLIN CO. et al.

(Circuit Court, S. D. New York. 140 F. R. p. 981.)

#### 1. EQUITY—PLEA—BURDEN OF PROOF.

The burden of proof rests upon the defendant to support a plea.

#### 2. SAME—OVERRULING OF PLEA.

Under equity rule 34, a degree pro confesso will not be entered on the overruling of a plea, unless the court is satisfied that it was interposed vexatiously or for delay; but the defendant will be assigned to answer the bill.

#### 3. PATENTS—PROOF OF ASSIGNMENT—CERTIFIED COPY OF RECORD.

A certified copy of a Patent Office record of a document purporting to be an assignment of a patent is not prima facie proof of the execution or genuineness of such assignment, nor is it made competent evidence by Rev. St. § 4898, as amended by Act. March 3, 1897, c. 391, § 5, 29 Stat. 692 [U. S. Comp. St. 1901, p. 5387.]



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured  
through the Patent Soliciting Office  
of E. G. Siggers, Patent Lawyer,  
Washington, D. C.

Arthur J. Thompson, Anderson, Ind. Hydrant.—The hydrant of this patent is provided with a plurality of nozzles, each of which is adapted to receive a hose for the discharge of water. Should one hose burst or otherwise become inoperative, the hydrant is provided with means for enabling the flow to the damaged hose to be readily cut off, without interfering with the flow of water through the other nozzles. The defective hose may be removed and replaced by a new hose. The hydrant comprises a casing provided at the bottom with a valve seat having a plurality of apertures, a plurality of discharge tubes located within the casing and extending upward from the apertures and terminating in independent discharge nozzles, a valve arranged on the lower face of the valve seat and adapted to cover and uncover the said apertures, whereby one or more of the tubes may be cut out, a valve stem extending through the casing and provided above the top of the same with a spring, and a cap arranged on the top of the casing and covering the spring.

Miles K. Lewis, Albany, Ore. Gate and Wire Stretcher. Two patents.—The first patent covers an improvement in swinging gates, and provides means for enabling a gate to be opened and closed at a distance from either side of it by a person on horseback or in a vehicle, without dismounting. The gate is adjustable vertically to permit it to swing clear of the snow drifts and other obstructions, and also to form a passage-way for sheep, hogs and other small animals. The gate is provided with eyes, which slide on elongated pintles of a hinge post. A rotary lever is loosely fulcrumed between its ends on the gate; it has a limited oscillation independent of the gate, and its arms are connected with the gate latch. Operating levers are located at a distance from either side of the gate, and are connected with the latch lever, so that when either of the operating levers is oscillated, the gate will be unlatched and swung on its pintles to open or close it.

The second patent is directed to a wire stretcher, which automatically maintains all of the wires of a fence at a uniform tension, and at the same time permits the wires to expand and contract under the varying conditions of the atmosphere and the changes in temperature, whereby the wires are prevented either from breaking or becoming loose. The wire stretcher comprises opposite uprights, a pair of vertical bars located between the uprights and connected with the fence wires, and weighted levers fulcrumed on the uprights and connected with the stretcher bars. The connecting means for the levers and the stretcher bars are crossed and each extends from one of the levers to the stretcher bar at the opposite side of the device.

James P. Bolding, Terrell, Texas. Seat Shaping Implement.—Considerable difficulty is experienced by jewelers in properly forming seats in the prongs or clutches of studs that are employed in the settings of precious stones. The present device is a simple tool capable of being used for practically any shaped seat. It consists of a pair of jaws pivoted together, a revolvable male die carried by the inner side of one jaw, and a revolvable female die that co-acts with the male die, and is carried by the other jaw. A prong-

positioning device is secured to the outer side of one jaw and is adjustable thereon. This device serves to properly locate the prongs in which the seat is to be formed. Means are also carried by the jaws for limiting their movement towards each other, in order to determine the depth of the seat.

Gabriel N. Wright, Madill, Ind. Ter. Railway Switch.—A distinctive feature of this patent is the automatic closing of the switch, whereby accidents, occasioned by trains running into an open switch, are effectually prevented. The switch may be held open by an operating device, which can be removed only when the switch is closed. The switch actuating mechanism is provided with a vertical shaft, which extends through the switch stand, and the latter has an arcuate slot, from which extends an entrance slot. The shaft is operated by a detachable lever provided with a lug, adapted to be passed through the entrance slot and arranged interiorly of the switch stand, when moved away from the entrance slot, whereby the lever is positively held against removal. A spring automatically returns the switch actuating mechanism and the operating device to their initial positions, when the lever is released.

John B. Marshall, Fresno, Cal. Fruit Picker.—This fruit picker enables fruit to be readily gathered from a tree without bruising or otherwise injuring the fruit. It guides the fruit to the ground or to a receptacle, and, if desired, it may be closed at the lower end to form a receptacle for the picked fruit which may be discharged when desired. The fruit picker embodies a pole, a flexible chute connected with the pole at opposite sides thereof, and a longitudinal cushioning strip mounted on the pole and arranged at the back of the chute. The fruit is picked by a pair of blades, one of which is rigidly connected with the pole. The other blade, which is pivotally mounted, is operated by a spring and a lever. The spring holds the pivoted blade normally open, and the lever closes the pivoted blade.

Scott C. Custer, Knoxville, Tenn. Drawers Support.—Mr. Custer has invented an ingenious device, adapted to be readily applied to trousers and forming a permanent portion thereof to receive the loop of the drawers, whereby the latter are positively connected with the trousers and are securely supported by the same. The device is applied to the trousers during the manufacture thereof, and is secured to the same by the means for fastening the buttons on the trousers. It is adapted to be used in connection with any character of button, and is also capable of being applied to the trousers independently of the buttons. It consists of a plate having an inner attaching portion, located wholly within the waist-band or upper portion of the trousers. The engaging portion of the device is located at the inside of the trousers, and extends upward from the bottom of the attachment portion, being formed integral with the same. The attachment portion is provided with openings to receive the fastening means, and the engaging portion has similar openings to facilitate the attachment of the device to the trousers.

James F. Myser, Rifle, Colo. Water Motor.—This invention relates to current motors, which can be placed in natural streams of water to obtain power therefrom. In carrying out the invention, a shore wall is constructed having a semicircular inset portion, forming an eddy compartment. A vertical shaft is journaled at the outer side of the compartment, and slidably mounted thereon is a horizontally disposed wheel frame comprising radiat-

ing arms. Horizontally swinging and feathering blades are mounted between the arms. When the arms project from the eddy compartment, the blades, engaged by the current of water, are thrown across the same, and thereby revolve the wheel, said blades, however, moving to feathering position as they pass through the eddy compartment. Geared to the top of the shaft is novel mechanism controlled by a hand lever, whereby the power derived from the motor can be employed for raising and lowering the wheel. Thus, in case of freshets, or if it is desired to stop the motor for any reason, it is only necessary to throw the elevating mechanism into gear with the shaft, whereupon the wheel will be raised from the water so that it will be stopped, and is furthermore out of danger.

Melvin Barber, Oklahoma City, Okla. Ter. Two patents. Tool Holder and Wrench.—The subject matter of the first patent is adapted for a variety of purposes, such as bit-stocks and the like, and is so constructed that it may be easily manipulated and will effectively retain the shank of a bit firmly in the stock, or permit the release thereof. A bifurcated head is employed, and in the bifurcation thereof are pivotally mounted gripping jaws, the pivot being located between the ends of the jaws. A shell is rotatably mounted upon the head and surrounds the main portions of the jaws, being provided with oppositely-disposed clamps arranged respectively to engage the jaws on opposite sides of their pivots. Therefore, when the shell is turned in one direction, one set of clamps engages the outer portions of the jaws to swing them towards each other, and when turned in the opposite direction, the other set of clamps engages the jaws on the opposite sides of the pivot to open the jaws. Novel means are employed for maintaining suitable friction upon the shell so as to prevent its loose movement.

The second patent is on a quick-action wrench of an exceedingly simple, but effective construction. A shank is employed having a jaw and teeth, and a movable jaw is slidably mounted on the shank. A holding sleeve, swiveled upon the movable jaw and surrounding the shank, has an interior lug, the inner face of which is disposed eccentrically to the axis of rotation of the sleeve, and is provided with eccentrically disposed teeth that co-act with the teeth of the shank and wedge between the same. The end of the lug nearest the axis of rotation of the sleeve is enlarged and constitutes a stop that abuts against the shank to limit the rotation of the sleeve. A handle grip secured to the end of the shank opposite that carrying the jaw, constitutes a casing in which a spring is mounted that bears against the sleeve.

Alfred Parfitt, Topeka, Kans. Two patents.—The first patent covers a peculiar boiler structure, and is particularly intended for high pressure locomotives, though not limited to this type. The boiler consists of a horizontal shell, with a fire box depending from one end of the shell and having its lower end projecting beyond the lower end of the shell. The fire box comprises a convexly curved foundation ring located at the lower end of the fire box, and outwardly curved wall sheets secured to the ring and decreasing in curvature towards their upper ends. This structure permits the sheets to expand and contract without imparting great strains thereto, and eliminating the danger of cracks or open seams.

The second patent covers more particularly novel means for connecting the fire box crown and shell sheets of a boiler. In one form of the inven-

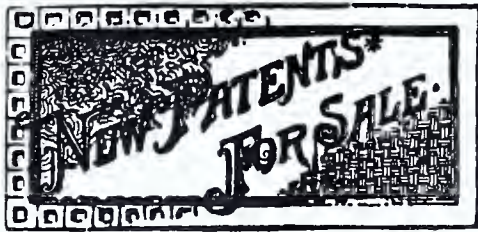
tion, a comparatively thick shell sheet is covered by a supplemental sheet section secured thereupon, and extending over a plurality of the openings therein. The ordinary fire box shell is employed, and a plurality of stay bolts are connected at their inner ends with the fire box sheet, the stay bolts passing through the openings in the shell sheet, and being engaged with the supplemental sheet. The stay bolts are provided with threaded inner and outer portions. A head is mounted on the inner end and bears against the inner end of the crown sheet. A nut is threaded on the inner portion and has a tapered end that coacts with the outer face of the crown sheet; and nuts, threaded on the outer portion of the bolts, are disposed on opposite sides of the shell sheet and have their opposing faces rounded, the shell sheet being recessed about the shank to receive the rounded faces.

Charles W. Lanpher, Norwich, N. Y., inventor; Coal Dealers Supply Co., Binghamton, N. Y., assignees. Three patents.—The first patent is directed to a metallic wagon box, designed particularly for hauling coal, and having means for relieving the central partition and the rear end gate of strain, to permit said parts to be readily removed from the wagon box, when desired. The wagon box has outwardly inclined sides, provided at their upper edges with rolls or beads, which are approximately centered over the sides and which project at the inner and outer faces thereof. The rolls or beads have free outer edges, abutting against the body portion of the sides and arranged to spring laterally. A tapered end gate, which is fitted between the sides, is provided with locking devices for engaging the rolls or beads. These locking devices have curved engaging portions, conforming to the configuration of, and interlocked with the rolls or beads, and held in engagement with the latter by the resiliency of the same.

The second patent covers a bag holder or stand for supporting a bag in an upright, open position to enable the same to be conveniently filled. The bag holder, which is capable of adjustment to suit various kinds and sizes of bags, may be readily clamped or locked in such adjustment. It is composed of an upright rod forming a standard, and substantially duplicate approximately U-shaped portions connected with the standard by T-shaped couplings and forming upper and lower arms. The lower arms constitute the base of the bag holder, and the upper arms, which are adapted to extend through the handles of a bag, may be swung upward or downward to arrange them at the proper elevation to support the bag in an upright open position. When the bag is filled, it may be quickly removed from the device by simply drawing the handles off the upper arms.

The third patent relates to means for supporting a chute and bag, or basket, upon the side of a wagon, or other vehicle, so that the material in the vehicle may be readily shoveled into such chute, bag or basket, and transferred to the place of storage. Spaced boxings, connected by a cross bar, are provided with jaws that are arranged to embrace the sides of the vehicle and support the boxings thereon. Slidably mounted in these boxings are vertically adjustable standards connected at their upper ends to the cross bar, on which the upper end of the chute is engaged and supported. The lower cross bar, carrying the boxings, is arranged to be engaged by hooks formed upon the upper ends of hangers provided with outturned lower ends that are connected by cleats. These cleats and outturned ends constitute a platform upon which baskets and bags to be filled, can be conveniently placed.





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A prize of \$20,000 is offered by the beet-sugar manufacturers of France to anyone who shall first discover and apply in France a new method of utilizing sugar in the arts. It is required that the method shall increase the consumption of French sugar 100,000 pounds per annum.

## Fighting Dust.

It is one of the hopeful signs of the times, so far as the good roads movement is concerned, that antidust leagues are being formed in various portions of the country. The processes chiefly relied upon in combating the dust evil are oiling, watering with deliquescent salts, and tarring. The first method consists in spreading upon a road—previously well swept—a heavy oil obtained from distilled petroleum. This spreading is effected with a brush, and a warm and dry period must be chosen. Salts, such as chloride of calcium, have been used in sprinkling the roads, but the drawback to this method is the ophthalmic effect on the eyes. Coal tar is so well known that it may be superfluous to explain that this is one of the by-products obtained in distilling coal for the manufacture of domestic gas. As a remedy for dust it has given good results, if used carefully. To obtain the most satisfactory effect, the road should be heavily rolled immediately before, and must be dry and clean. The air should be warm. A shower coming soon after application will spoil the treatment. The tar is applied hot, and traffic must be stopped for from 12 to 20 hours after the operation.

Oil tar is the residuum of the manufacture of carbureted water gas. It is a dark liquid, not very thick, weighing a little more than water. It can be applied on a bad road, but is not so durable as coal tar. On the other hand, its cost price is low. Numerous trials, however, demonstrate that coal tar, obtained as above described, is the most efficacious remedy for allaying dust, of anything yet tried. The expense is estimated at only a few cents per square yard.

## Progress in Electricity.

One of the significant signs of the times is the extension of the facilities placed at the disposal of students in various lines of scientific endeavor, not only in universities, but in museums and other institutions where free access is allowed to every one. News comes from Belgium that a laboratory has been equipped and opened by a private philanthropist, for the benefit of those who wish to extend their knowledge of the possibilities of electricity. The building will contain all kinds of electrical models and appliances, which may be freely handled for study and experiment. Models and apparatus will be conveniently placed at the disposition of the public upon separate tables, and may be connected with the electric current at will.

For example, a person desiring to familiarize himself with running an electric tramway, will find a complete model, about ten inches long, of an electric car, which he may examine at his pleasure, and operate upon the diminutive rails. Reduced models of every part of an electric street car system, various dynamos, etc., are to be found in the museum. One section is to be devoted to apparatus serving to produce phenomena due to magnetism and to electricity by friction and chemical reaction. In another are machines of all sorts, lamps, bells, agricultural and dairy implements, conveniently exhibited, which may be worked by simply adjusting the electric appliance supplied to each table. Another room contains large motors, dynamos, etc., with which the public is at liberty to experiment. There will also be free telegraph, wireless telegraph, and telephone offices, and the latest scientific periodicals will be on file in a reading hall.

An institution on similar lines has been recently opened in New York City. An account will be found, in another column of this edition, of this unique laboratory, the special object of which is to test the value of inventions in the field of electricity. The lasting qualities and illuminating powers of electric lamps are subjected to rigid examination. Filament lamps are tested to determine whether the filament droops; whether weak spots form in the filament; what degree of light they emit; and how long they burn. Arc lamps are tested as to the evenness of distribution of light; as to the proper elevation above the street; as to their action under direct and alternating currents; as to expense of maintenance, etc. In another department, different insulators are tested. Currents as strong as 150,000 volts are passed through coils, and trials are made as to what substances most retard the passage of the electrical current. In the standardizing room are instruments of such absolute accuracy and such delicacy that they might also be considered products of the Black Art.

Such institutions as those described will be of great benefit in affording practical information as to the use of electricity, and in helping to solve the problems that arise in the application of this unexplained force. In

this connection, it is interesting to remark that the Worcester Polytechnic Institute will open, next fall, what will be the largest electrical engineering laboratory in the world. The feature which will attract the greatest amount of attention is the arrangement for testing electric railways. Connection will be made with the tracks of the city railway system, so that electric cars can be run directly into the laboratory and the tests conducted there. The institute, it should be noted, is a pioneer in this line of work, and has the only independent chair in electric railway engineering in the country.

## Making Aluminum by Electricity.

The fact that the production of aluminum has by no means kept pace with the demand for this most useful metal, lends importance to the account of a method of refining aluminum by electrolysis. Aluminum has been found invaluable in the construction of automobiles, as well as in many parts of engine work. It is used by large factories for cooking pots and pans of all sorts, and is capable of use in almost any place where brass has been employed, having, in addition to other desirable qualities, about one-third the weight of brass. Aluminum wire is employed for the transmission of electricity for power and light, the cables from New York to Niagara being composed of this metal. It is useful in the printing industry, and also in the form of powder, for many applications. The carriages on the London underground tube lines are paneled inside with aluminum. Large amounts of the cheaper brands of the metal are employed in steel and iron works for obtaining better and sharper castings of the metals. In combination with carbon and ammonium nitrate, it forms a powerful explosive. These are but a few of the many uses to which it can be put, the number of which is daily increasing: the supply, on the other hand, has been diminishing. There are at present but three sources—an American company operating at Niagara Falls, a British company in Scotland, and the Neuhausen Works in Switzerland. The market price of ingots has been quoted at \$850 a ton, or \$200 higher than a year ago; but this quotation is purely nominal, because there is so little of the metal to be had. The conditions in the United States have been aggravated by a strike, and when Americans tried to purchase in the European markets, they found that there was practically an aluminum famine.

The electrical production of aluminum consists in the use of the impure alloy of the light metal as the anode, in a bath of molten cryolite containing alumina in solution, while pure aluminum forms the cathode. All the materials in this bath are kept in the molten state, and the three components are maintained in their respective positions by their different specific gravities, the impure alloy being the heaviest and the pure aluminum the lightest of the constituents of the bath. By this method, aluminum can be parted from iron, silicon, copper and

other impurities, and it is thought that it will prove of importance in cheapening the production of the metal, since it will enable the producers to use bauxite directly in the reducing baths in place of the much more costly refined alumina. The present system of using the refined alumina in the reducing baths makes it impossible to affect any great reduction in price, and therefore the discovery of new methods of dealing with bauxite to enable it to replace alumina is of value.

## Ticket Printing Machine.

It must have occurred to every business man, on the jump to catch a train, that the system of handling railroad tickets is cumbrous and elaborate, involving a waste of time quite out of harmony with the up-to-date methods generally in vogue in railway systems. Thousands of tickets, different sets for all stations and for various classes, have to be kept on hand. Great care is needed to keep them in order, and time is lost in selecting and preparing them. This not only makes the production of the tickets expensive, but the system takes up much room and requires the constant attention of a trained officer. A machine has been devised to remedy this difficulty. It is intended to print with little labor, on heavy cardboard, all tickets whenever wanted. The tickets thus printed contain the names of the station of departure and destination; the date of issue; the number of the register; whether it is a single or a round trip; and the amount of fare. On a second strip of cardboard in the inner part of the machine an exact duplicate of the ticket is simultaneously produced, thus furnishing complete registration of every ticket sold. The capacity of the apparatus is said to be surprising, since it can print and register four hundred different kinds of tickets. It is necessary for the agent merely to make a few movements of the hand in order to furnish the ticket called for, while at the same time a figure appears on the outside of the counter, indicating to the passenger the price of his fare. This machine is the invention of an Italian, and it is reported that the Italian Government has been trying it with satisfactory results. It is to be hoped that something of the sort will soon be established in this country, which has the reputation of leading the world in time-saving devices.

## Earthquake Proof Buildings.

One of the teachings of the recent fearful earthquake tragedy at San Francisco is that skeleton steel construction is more nearly earthquake-proof than any other known form, and becomes almost perfectly so when coupled with armoured concrete walls. When we consider the bird-cage plan of the modern steel building, the perfect bonding of all its parts, and the inherent elasticity and toughness of the material used, we need seek for few more reasons to support this view. Reduce the heights of the buildings, and another important advantage is gained, as the stresses in the frame, due to lateral movements of the earth, thus become less. Armoured concrete walls are homogeneous and become integral parts of the steel frame, so that the final structure is likely to prove almost ideal in earthquake wrenchings. It is to be hoped that these facts will be duly considered in the rebuilding of San Francisco,—in fact in all places subject to seismic disturbances.—*Cassier's Magazine.*



### Alcohol from the Manioc Root.

A recent number of the *Bulletin Economique* (Madagascar) reports that practical experiments made for the manufacture of alcohol from the manioc root (*jatropha manihot*) have given promising results. From a sample (quantity not stated) of absolutely dry manioc root was produced 95.5 per cent of sugar. This large percentage, which varies according to the degree of aridity of the manioc, has naturally attracted the attention of distillers. In commercial experiments, from 220 pounds of manioc root, about 10 to 13 gallons of crude alcohol were produced. Consequently, by reason of its low price, several large Paris distillers have adopted the use of manioc in their distilleries. Manioc root is already used extensively by starch and glucose manufacturers and furnishes food for both man and beast: therefore, this new use of it for manufacturing alcohol bids fair to place it in the front rank of colonial products.

### A Balloon Incline Railroad.

Consul Wm. Bardel writing from Bamberg states that Engineer Balderauer, of Salzhurg, has invented a balloon railroad, experiments with which are now being made in the mountains in the neighborhood of that German city.

It consists of a stationary balloon, which is fastened to a slide running along a single steel rail. The rail is fastened to the side of a steep mountain, which ordinary railroads could not climb, except through deep cuts and tunnels. The balloon is to float about 35 feet over the ground, and a heavy steel cable connects it with the rail. The conductor can, at will, make the balloon slide up and down the side of the mountain. For going up, the motive power is furnished by hydrogen gas, while the descent is caused by pressure of water, which is poured into a large tank at the upper end of the road, and which serves as ballast. Suspended from the balloon is a circular car with room for ten passengers. The cable goes from the bottom of the balloon through the center of the car to a regulator of speed, which is controlled by the conductor. The inventor of this railroad claims that his invention will force all incline cable roads out of existence.

### New Electric Lamp.

An Austrian chemist, Dr. Hans Kuzel, has, after many years hard work, succeeded in constructing a new electric lamp, which he calls the Syrius lamp. As is well known, incandescent gaslight is cheaper than electric light, because the filament wires of the latter are very expensive and the glass bulbs soon wear out. Doctor Kuzel has now invented a new substitute for the glow-thread, by forming out of common and cheap metals and metalloids, colloids in a plastic mass, which can be handled like clay and which, when dry, becomes hard as stone. Out of this mass very thin wire threads are then shaped, which are of uniform thickness and of great homogeneity. These characteristics are of great value in the technics of incandescent lamps.

The Kuzel or Syrius lamp hardly needs one-quarter of the electric current which the ordinary electric lamp with a filament wire requires. Experiments, it is asserted, have shown that the lamp can burn for thirty-five hundred hours on a stretch. Another

advantage is that the intensity of the light of the new lamp always remains the same, the lamp bulbs never becoming blackened, as is now the case. The new lamp, it is said, will be put on the market next autumn.

### Prevention of Accidents.

If an accident happens to a workman in certain countries of Continental Europe, the law assumes that it must be due to the negligence of the employer. The regulations for preserving life, for aiding and pensioning the incapacitated, for preventing accidents, are strict to a degree wholly unknown in the United States. In spite of the swarming populations of the older countries, human life is apparently held of higher account than on this side of the water. The system of charitable institutions for the benefit of laborers is so far-reaching, as to practically amount to a government insurance policy. It is compulsory and so arranged that employer and employee pay a certain amount monthly, in proportion to wages paid or received, into a fund over which the State exercises a strict control. This, of course, apparently represents an additional burden to the employer, but it is found to pay in the long run.

This humanitarian sentiment has found expression, in Paris, in a permanent exhibition of appliances to obviate accidents to operators of machinery. Here are installed the apparatus usually found in factories. The machines are in motion, and a practical demonstration is given daily by an official in charge.

Fly wheels within the height of the operator are surrounded by high screens of substantial wirework. If the wheel is small and a screen impracticable, the spokes of the fly wheel are hidden by light plates that make it impossible for the clothing or person of the operator to become involved in the wheel.

Horizontal saws are entirely protected by an ingenious arrangement somewhat on the plan of the sticks of an ordinary fan, which can readily be swung backward or forward to admit work of varying sizes. Ribbon or hand saws are encased in angle pieces or practical boxes wherever it is possible for the operator to come in contact with the blade.

All gearing to lathes is enclosed, and a practical and readily detachable casing over the end gears permits the change of these gears in the screw-cutting machines.

Emery wheels are closely encased, and the operator protected from injury from the dust and flying particles. Drills, planning and mortising machines are guarded at all parts, and it would seem that a determined effort would be required on the part of the operator to secure injury.

In spinning and knitting machines, special attention is taken to protect the skirts of female operators.

In short, safety to the operator is an important consideration for machine manufacturers abroad, and this immunity has been developed to a high degree of perfection. It might be well for our great American corporations to adopt a similar system, as it is not difficult to see the advantages to both sides.

### Electric Signaling.

Two new devices to warn trains, and thus prevent accidents, are being tried in Europe. Much interest has been shown in Germany in the practical tests of an apparatus that has proved itself successful even under the most unfavorable conditions, due to rain, snow, fog and darkness. Experiments have been made—as is always the case with the painstaking thorough Germans—on a specially prepared track, several miles in length. Each locomotive was supplied with an apparatus, which occupies but little space, its dimensions, including the storage battery, hardly exceeding a foot in any direction. Communication between this apparatus and the two track rails was supplied by the metal parts of the locomotive through the axles and wheels, while an insulated contact device connected the apparatus with a carefully insulated auxiliary rail running midway between the track rails, the contact device being so arranged that it could easily be moved back and forth or sideways. Positive and negative impulses could thus be sent in different directions, frequent changes being made from one rail to another.

If there is an obstruction of any kind within a certain distance, an alarm is given, both visibly and audibly, by means of a red light and by the ringing of a bell. No matter how many locomotives there may be on the track, each gives its warnings. Engineers, signalmen, and station masters can thereupon communicate together by telephone, the central auxiliary rail serving as the channel of communication. In each locomotive there is a telephone which is protected against the vibrations caused by the motion of the locomotive through being fastened on springs like a bicycle lamp.

If for any reason a storage battery becomes exhausted, it can be replenished with electricity produced by the locomotive: and even if this supply fails, the current from a semaphore or signal station can still transmit to the engineer explanations and instructions. If by mistake a semaphore falsely registers "free track," the endangered trains nevertheless supply each other with signals of warning. An alarm is also given automatically when a switch is falsely set or insecurely closed.

This system requires neither wires nor poles, their place being supplied by massive and more reliable iron.

The auxiliary line, consisting of ordinary T iron, may be limited to important or dangerous portions of the track where the view is obstructed, or to the vicinity of sidings, curves, bridges and tunnels. Old rails may be utilized for the central auxiliary line. Thus the cost of even an uninterrupted line can be made very small in comparison with the value of lives and merchandise thus protected.

The other device is being tested in England, and its friends believe that the principle, at least, will be eventually adopted by the railways there. The dense fogs in England, and the attendant expense of employing extra men and means to avert disasters, make the need of automatic signaling on British railways peculiarly imperative. The new device, like the one just described, is so arranged that in case of danger, a gong sounds on the engine and an immense bull's

eye on the cab throws a glare into the driver's face. Beyond the spot where, at present, the distant signal is located on the railways, the invention proposes that a central rail 100 yards in length should be laid, with a second and much longer central rail near the present home signal. Connected electrically with the signal box, the pressure of a roller beneath the engine on these central rails would not only ring a bell and cause a lamp (corresponding with the track upon which the train was running) to glow on the signal box, but bells would ring and red or green lamps glow on the engine itself, the color of the lamp depending upon which rail (the right or left) the signalman had converted into a negative.

It is a curious instance of British conservatism that although the theoretical soundness of this invention is not questioned, and although the need for some system of electric signaling is generally recognized, railway men in England are unwilling to give it a practical test. The curious objection is urged that engineers might lose alertness and rely absolutely on the gong, if the system were installed: and should the apparatus then fail to work, hideous results would follow. In view of the fact that only a few months ago the train service of London was utterly crippled by fog, and trains were unable to either depart or arrive, one would think that any promising system would be welcomed, as bettering present conditions.

### Wind Power.

The chief objection to wind power practically is its uncertainty in amount and the variable speed of the motor itself. Under stress of necessity there is little doubt that the regulation difficulty would be, in great measure, overcome so as to give practically uniform speed over a pretty wide range of wind pressure.

The average velocity of the wind is low, in most places between 5 and 10 miles an hour, corresponding, respectively, to wind pressures of from 2 to 8 ounces per square foot. These are too low to be conveniently utilized, on account of the large dimensions demanded in the motors. During portions of nearly every day, however, somewhat higher velocities are recorded, since the averages contain considerable periods of very light breezes occurring often within a few hours before and after sunrise and sunset. Hence, there are few days without periods of brisk breezes of from 15 to 20 miles an hour, giving wind pressures of from 1 to 2 pounds per square foot. On the other hand, winds exceeding 30 miles an hour (4.4 pounds per square foot) are sufficiently rare to be the subject of special record in the Weather Bureau.

An effective wind motor should be able to work at good advantage up to, say 5 pounds per square foot pressure at fairly uniform speed, and should be robust enough to stand up against winds of 50 and 60 miles an hour without going by the board. For certain uses, such as pumping, speed regulation is not necessary; but if wind power is to be included as a resource in the great power situation, even on a small scale, regulation is necessary, and it has thus far been carried out only to a very limited extent.

It is probable that winds may be relied upon for the ordinary uses of agricultural communities, although they do not form, save in the region of the trades, anything like a reliable source of power. For the larger work of power production they cannot well be regarded as important, and in certain districts they are too unreliable even for casual use.—*Cassier's Magazine*.



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Tub, sink and washbowl, Combination ..... W. C. James  
Tub cleaner ..... G. W. Dean  
Turbine ..... G. L. Mundigler  
Turbine, Elastic fluid ..... C. G. Curtis  
Turbine engine hydrocarbon ..... J. Zander  
Turbine, Multiple stage reaction P. F. Oddie  
Turbine, Steam ..... C. A. Parsons et al  
Turn tables, Propelling wheel for ..... J. L. Pilling  
Twisting machine ..... D. Metzger  
Type, Space for justifying lines of ..... D. B. Ray  
Type writer ribbon attachment, Sight writing ..... C. A. Joerissen  
Type writing machines, Line spacing and carriage releasing mechanism for E. G. Latta  
Umbrellas, Device for holding expanded ..... E. Nootbar  
Valve ..... F. L. Smith  
Valve ..... J. Kennedy  
Valve ..... F. Schreidt  
Valve, Automatic relief ..... A. Harrison  
Valve, Check ..... G. W. Rich  
Valve, Engineer's ..... J. F. McElroy  
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Valve for heating or other systems where steam is employed ..... F. C. Goff et al  
Valve gear, Engine ..... H. Leutz  
Valve, Steam ..... A. H. Farmer  
Vehicle, Combination ..... J. W. Nussbaum  
Vehicle draft and steering gear ..... P. W. Martin  
Vehicle, Motor ..... C. Stumma  
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Vending machine, Cigar ..... A. M. Stanley  
Ventilator ..... C. L. Pullman  
Vibrator ..... H. F. Rooney  
Wagon ..... W. I. Brown  
Wagon brake, Dump ..... T. R. McKnight  
Wagon dump, Portable ..... J. F. White  
Wardrobe rack, Folding ..... J. W. Kennedy  
Washing machine ..... H. A. Bierley  
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Water gate, Automatic ..... N. O. Fleming  
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Water heater ..... R. E. Harris  
Water heater, Noiseless steam ..... G. Hufnagel  
Water tube boiler ..... J. C. Sherry  
Water wheel speed regulating device ..... H. E. Warren  
Wave motor ..... D. H. Mowen  
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Well mechanism ..... M. E. Layne  
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Wheel ..... A. J. Robertson  
Wheel ..... S. J. Turner  
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Winding drum ..... W. S. Edward  
Winding frame, Yarn ..... P. Taylor  
Winding machine bobbin ..... C. Ryden  
Window ..... P. McGinnis  
Window bracket ..... A. Brzykay  
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Windrower ..... L. Franzmeier  
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Wood embossing machine ..... J. J. Powell  
Writing guide ..... J. C. Dana  
Writing machine ..... E. B. Hess

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Automobile engine hood and seat support ..... A. B. Schultz  
Badge ..... F. Busse  
Box strap ..... C. W. Mitchell  
Button ..... M. L. Evans et al  
Clock frame ..... S. M. Lawson  
Cloth rider down ..... C. H. French  
Crumble tray ..... M. M. J. Rooney  
Eraser tip ..... F. McIntyre  
Fabric, Knitted ..... 2 pats ..... F. Conde  
Lavatory ..... J. F. Kelly  
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Plate or similar article ..... W. H. Grindley  
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Advertising calendar ..... W. S. Thorp  
Advertising carton ..... W. F. Hill  
Advertising device ..... L. Greenberg  
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Air brake ..... G. E. March  
Air compressor ..... B. Obar  
Alkyl oxyacetyl compound of pyrocatechin-monoethyl ether ..... R. Berendes  
Anchor ..... W. L. Adams  
Andiron ..... P. E. Leveritt  
Angle sawing mechanism ..... P. A. Millet et al  
Animal trap ..... S. G. Ewen Jr  
Antilubricant throwing device ..... E. A. Barnes  
Arbor, Friction ..... P. P. Nungesser  
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Automobile extension canopy frame ..... L. C. Shipley  
Automobile steering check ..... H. Geisenhoner et al  
Automobile wheel ..... J. C. Higdon  
Axle ..... S. H. & A. V. Nickerson  
Baby chair ..... A. P. Perkins  
Baling press ..... C. E. Wehrenberg  
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Bath tub cabinet ..... A. M. Ellegar  
Bayonet ..... T. S. Forbes  
Bearing ..... E. J. Newton  
Bearing, Ball ..... R. Conrad  
Bearing for measuring instruments ..... W. M. Bradshaw  
Bearing for spring hinges, Ball ..... E. Bommer  
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Bedstead ..... J. W. Whitlow  
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Bell box ..... S. A. Beyland

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Binder, Loose leaf ..... J. C. Dawson  
Binders, Leaf or sheet for temporary or loose leaf ..... H. F. Bushong  
Blind fitting, Window ..... E. C. Harris  
Boat, Submarine ..... T. H. Wheelless  
Bodkin ..... L. F. Earl  
Boiler cleaner ..... J. G. Broman  
Boiler flue cleaning apparatus ..... E. A. Baker  
Boiler furnace, Steam ..... J. Monville et al  
Boiler stand and coupling, Combined ..... S. E. Hopper  
Bookkeeping machine ..... M. M. Cohn  
Bottle, Artist's ..... R. Weber  
Bottle cap fastener ..... G. A. Williams  
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Bottle holder, Ink ..... E. L. Drinkwater  
Bottle, Non-refillable ..... J. F. Mullarkey  
Bottle, Protective ..... J. C. Henderson  
Bottle stopper ..... R. Stock  
Bottles, Device for preventing the deceptive refilling of ..... 2 pats ..... L. F. Hammer  
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Box making machine ..... F. J. Reinhold  
Brake shoe, Steel back ..... N. H. Davis  
Branner feeding device ..... L. C. Steele  
Brick compound, Fire ..... T. P. Gourley  
Bridge ..... A. F. Campbell  
Bridle bit curb or controller ..... A. Buermann  
Brooder, Cool ..... N. A. Lybeck  
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Brush ..... M. W. Wright  
Brush bridle ..... L. S. Lesso  
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Brush, Rotary ..... H. Nielson  
Brush with grooved block, Sectional ..... C. A. Fatters  
Buckle, Cross line ..... F. S. Smith  
Buggy spring ..... W. M. Heeter  
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Building, Frame ..... A. Muller  
Burglar alarm ..... G. Balint  
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Cake forming machine ..... E. B. Anderson  
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Calipers and dividers ..... G. C. Smith  
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Can spout cap, Oil ..... N. Nelson  
Canopy support ..... W. J. Snyder  
Car brake ..... O. M. Jones  
Car construction ..... A. Porter  
Car coupling ..... L. C. Cary  
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Car grain door ..... T. Lennox  
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Car grain door, Freight ..... J. Rohrberg  
Car guard, Open railway ..... E. W. Wheelock  
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Car or wagon, Dumping ..... E. S. Boyd  
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Car replacer ..... S. C. Johnson et al  
Car seat ..... H. Witte  
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Carburetor for gasoline engines ..... R. A. Middleton  
Carpet sweeper ..... H. W. Ru Ton  
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Case hardening apparatus ..... A. W. Machlet  
Cash register ..... J. P. Cleal  
Cellulose ..... 2 pats ..... J. S. Cochran  
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Check holding and cutting device, Conductor's ..... A. D. Joslin  
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Chenille machine ..... C. Wiebke  
Child's chair ..... W. F. Oliver  
Churn and butter worker, Combined ..... F. La Bare et al  
Clamp ..... W. Schaurr  
Clock ..... E. M. Goldsmith  
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Clothes drier ..... A. T. Hagan  
Clothes drier and hat and coat holder combined, Folding ..... W. S. Pugsley  
Clothes line, Pinless ..... R. K. Peters  
Clutch, Friction ..... H. D. Hubbard  
Clutch, Friction ..... E. H. Waugh  
Clutch, Friction ..... 3 pats ..... J. F. Duryea  
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Combing machine ..... E. H. Rooney  
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Concrete mold ..... I. L. Landis  
Concrete structure ..... J. F. Ancona  
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Connecting rod ..... G. A. Giles  
Contact device ..... K. Tornberg  
Continuous kiln ..... W. A. Butler  
Conveyer, Portable distributing ..... G. Wenzelmann et al  
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Cord machine ..... B. M. Schaubman  
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Corset ..... D. H. Warner  
Cotton chopping machine ..... O. L. Carmical  
Cotton, Separating ..... W. A. Patterson  
Cotton separator ..... W. A. Patterson  
Coupling ..... G. Lloyd  
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Course finder ..... J. F. Smith  
Cracker case ..... J. N. Phenix

Crate, Folding shipping ..... D. B. Rodkey  
Cuff and wristband ..... W. M. Shewry  
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Cultivator, harrow and planter, Combined ..... A. B. Johnson  
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Current motor, Alternating ..... C. P. Steinmetz  
Current motors, Controlling alternating ..... F. E. Case  
Cushioning device for freely gyrating mechanisms ..... J. F. Harrison  
Cut out for electric circuits, Thermal ..... J. C. Armor  
Dancing figure, Automatic ..... H. Wolke  
Derrick ..... P. F. Fitzgibbons  
Dialkylmalonylureas, Making ..... G. Keil  
Die ..... J. S. Alston  
Directory holder ..... E. B. & F. A. Taylor  
Dispensing can ..... R. F. Morse  
Display rack ..... W. D. Wilbur  
Distillation apparatus ..... J. I. Brennan  
Distributing board ..... F. J. Dommerque  
Doffer comb motion ..... O. L. Owen  
Door check ..... J. S. Young et al  
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Door, Convertible screen and storm ..... H. Barber  
Draft equalizer ..... W. S. Emert  
Drapery, Rail ..... E. M. Crawford  
Drawers and the like, Guiding means for ..... G. C. Gardner  
Dredge, Suction ..... C. N. Newcomb  
Drier ..... J. W. Biles  
Dyeing machine ..... J. Hussong  
Earth transporting mechanism ..... W. Zimmerman  
Eaves trough hanger ..... A. B. Leonard  
Electric cableway system ..... M. W. Dav  
Electric machine, Dynamo ..... R. H. Rogers  
Electric machine, Dynamo ..... W. Stanley  
Electric switch ..... C. S. Barkeley  
Electric system of transmission ..... C. G. & E. J. Burke  
Electrical energy, System of applying alternating current ..... B. G. Lamme  
Elevator catch ..... J. Morgan  
Elevator safety brake or lock ..... F. Williams  
Elevator tumbler, Bucket ..... J. H. Gray  
Engine ..... H. Thomson et al  
Engine ..... J. N. Cummings  
Engine construction ..... G. B. Petsche  
Engine lubricating pump, Locomotive ..... J. F. McCanna  
Engine metering device ..... E. L. Tucker  
Engine spark and valve controlling device, Explosion ..... R. M. Keating  
Envelope closing machine ..... C. O. Lilleros  
Excavating dipper ..... J. H. W. Libbe  
Excavator ..... G. W. Nicolson  
Excavator ..... T. P. Payne  
Explosive fluids, Safety reservoir for ..... C. J. Coleman  
Extension table ..... T. M. McKee  
Fastening device ..... S. Stevens  
Feed regulator, Boiler ..... O. O. White  
Feeder, Stock ..... H. B. Gamblin  
Feeding and watering trough, Stock ..... J. Paulus  
Fence lock, Wire ..... E. G. Overholt  
Fence tie, Wire ..... G. R. Mills  
Fiber cleaning machine ..... A. G. Pons  
Film holder, Magazine ..... O. Becker  
Filter, Suction ..... P. Argall  
Fire extinguishing apparatus ..... J. Holm  
Fireboard ..... S. F. Williamson et al  
Fish plates, Apparatus for manufacturing ..... P. J. Dalton  
Fishing reel ..... B. K. Donaldson  
Flagstaff column ..... R. W. Teese  
Flash light apparatus ..... J. Fiedler et al  
Flue cleaner ..... W. P. Wilson  
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Fluid generator, Elastic ..... J. C. Tonkin  
Fluids, Grating for facilitating the flow of ..... J. Grouvelle et al  
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Furnace charging mechanism, Cnola ..... C. E. Brown  
Fuse, Projectile ..... H. P. Merriam  
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Game Parlor ..... J. A. S. Chevolleau  
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Gas generating kiln, Revolving ..... S. E. Steurin  
Gas generator, Acetylene ..... R. A. Carl  
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Gear, Transmission ..... W. H. Hollopeter  
Gearing ..... A. Harold  
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Glass blowing machine speed controlling device ..... J. F. Hitter  
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Glass machine, Wire ..... N. Franzen  
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Grinding drills, boxes and like tools, Apparatus for ..... F. Schmalz  
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Journal box and dust guard, Convex ..... J. S. Patten  
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Journal box, Car ..... J. S. Patten  
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Lamp heater ..... J. W. Summers  
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Lifting jack ..... E. Cook  
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Mail delivery apparatus, Rural ..... R. M. Bartholomew  
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 Paper and book holder. Combined. E. Pashley  
 Paper bag machine. W. A. Lorenz et al  
 Paper bag machine. Self closing. O. Desrosiers  
 Paper from one roll to another. Roll for the accurate winding of a sheet of. W. B. Fleming  
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 Paper stock. Machine for reducing rags for. J. L. Perkins  
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 Pencil sharpener. F. Lagerholm  
 Pharmaceutical compound. F. Hofmann  
 Phonograph and graphophone records. Portable cabinet carrying case for. H. W. Topham  
 Phonograph record roll. C. C. Shigley et al  
 Photographic developing apparatus. G. Eastman  
 Photographic plate for color photography. A. L. Lumiere  
 Physical culture appliance. M. A. Wilcox  
 Piano action flange. F. C. Billings  
 Piano playing mechanism. Electrical. C. E. Brown  
 Picture frame. A. G. Schrick  
 Pictures. Apparatus for producing moving. H. A. Farrand  
 Pile driver. F. P. Mayo  
 Piles. Sinking and building concrete. R. A. Cummings  
 Piles. Sinking concrete. R. A. Cummings  
 Pipe or conduit. C. H. Wilson  
 Pipe wrench. C. H. Thurston  
 Pistol grip. G. C. Bourne  
 Planter. Corn. S. G. Lohr  
 Plow. Expanding wheeled. N. Sanders  
 Plow. Subsoil. E. Kraal  
 Pneumatic drill. A. P. Hanscom  
 Pocket fastener. E. S. Earhart  
 Pot stirrer. F. M. Leaf  
 Potential indicator. Portable. J. B. Taylor  
 Power generating apparatus. 2 pats. W. L. R. Emmet  
 Power generating apparatus. J. Flindall  
 Power system. W. L. R. Emmet  
 Power transmission. C. Phillips  
 Presses and the like. Feeding mechanism for. A. Eschenbach  
 Pressure indicator and recorder. W. H. Bristol  
 Pressure varying device. W. B. Mason  
 Printing machine for warp-printing devices. F. Schmidt  
 Propelling ships. A. Gambin  
 Pruning implement. J. W. Payne  
 Pulp screening machine. E. W. Goodrick  
 Pump governor. H. W. Geare  
 Punching bag. Coin controlled. R. H. Hartley  
 Puzzle. F. W. Jacob  
 Puzzle. W. E. McGraw et al  
 Pyrometer. E. Bennett  
 Radiating, cooling, and condensing apparatus. Tube for. J. G. A. Kitchen et al  
 Radiator. Sheet metal. J. Maris  
 Radiator. W. R. Kinnear  
 Rail joint. A. B. Knopf  
 Rail track system. W. J. Sterling  
 Railway. M. R. Longacre  
 Railway crossing. R. W. Cress  
 Railway joint. M. W. Bell  
 Railway rail joint. F. L. Priest  
 Railway signal apparatus. 2 pats. E. L. Nolting  
 Railway signaling system. J. B. Struble  
 Railway switch. Automatic. A. M. Frish  
 Railway switch rod. W. S. Weston  
 Railway tie plate. G. W. Duke  
 Railway traffic controlling apparatus. C. J. Coleman  
 Ratchet mechanism for tools. J. P. Bartholomew  
 Ratchet wrench and drill. Combined. J. R. Neilson  
 Reading and invalid table. Combined. W. B. Young  
 Reel carrier. W. G. Hatcher  
 Reflector. E. L. Zallinski  
 Regulator. A. Roesch  
 Reinforcing tube. W. H. Smith  
 Rheostat. G. E. Stevens  
 Rheostat. Motor starting. H. Geisenhoner  
 Rheostat. Starting. D. Miller  
 Rifle with hinged or tilting barrel. F. Jager  
 Rock drill. A. H. Gibson  
 Rolling mill. O. Briede  
 Rolling mill for rolling seamless metal tubes. O. Briede  
 Rotary cutter. A. J. Corley  
 Rotary engine. C. M. Cagle  
 Rotary engine. G. P. Clark  
 Rotary engine. A. S. Levaque  
 Rotary engine. W. A. Brown  
 Rotary engine. W. O. Steele  
 Roundabout. C. H. Ware et al  
 Rubber boot. C. M. Hannick  
 Rubber boot. F. F. Schaffer  
 Rubber sheeting. Producing elastic and scented. W. F. A. Schrader  
 Rubbing and polishing machine. J. W. Maddox  
 Ruling machine. Paper. C. F. Taylor  
 Safety pin. Pocket. B. Almy  
 Sales slips. Case for duplicate. C. C. Mumm et al  
 Salt shaker. G. J. Vester  
 Sand blast apparatus. H. Luckenbach  
 Sash and door lock. F. E. Busch  
 Sash balance. F. A. Bickley  
 Sash fastener. J. A. Winn  
 Sash fastener. F. Sieder  
 Sash lock and balance. W. A. Winter  
 Saw set. J. F. Dorman  
 Saw table for curved work. B. Wilson  
 Scaffolding. J. Emberson  
 Scale. Platform. G. Jones  
 Scale. Spring. G. Walker  
 Scissors. W. E. Jones  
 Scope and distance finder. T. H. Mitchell  
 Scraper. B. Henninger  
 Scraper and grader. Road. J. H. Osten  
 Seal. Box. E. J. Brooks

Seal. Coil wire. E. J. Brooks  
 Sealing apparatus. Envelop. E. J. Brasseur  
 Search light projectors. Control system for. J. L. Hall  
 Seat back support. A. C. Clark  
 Seed cleaning apparatus. Cotton. P. T. Rood  
 Seed separator. Cotton. J. C. Winder  
 Self leveling table. F. F. Meyer  
 Sewing machine. Button. C. A. Powell  
 Sewing machine locating gage. C. C. Miller  
 Sewing machine presser foot. A. Bivins  
 Sewing machine ruffler. J. M. Greist  
 Sewing machine thread controlling device. C. V. Bauer  
 Shade and curtain bracket. W. J. Connell et al  
 Shawl strap bar. Extensible. J. Connell  
 Shock loading machine. W. O. Crawford  
 Shoe. R. Moos  
 Shoe machinery cutter guard. L. B. Legge  
 Shoe polishing device. L. L. Clippinger  
 Sign. Illuminated. M. L. Feikin  
 Signal receiving system. Visual. E. A. Fallor  
 Silica and shaping the mass while plastic. Fusing. J. F. Bottomley et al  
 Silk ungumming apparatus. P. Schmid  
 Sinker. J. H. Shephard  
 Siphon. G. D. Foster  
 Siphon. Flush tank. R. C. De La Hunt  
 Skating rink. Merry. H. Loiseleur  
 Skid. T. H. & J. W. Monahan  
 Smoke arrester. Heat saving. J. Wagner  
 Sparking devices. Current distributor for. J. M. Smith  
 Spectacles. T. A. Willson  
 Spinning filer. C. Wiebe  
 Spool or reel. E. B. Crocker  
 Spooling machine. Jack or dresser. M. Ingham  
 Spring clips. Forming. J. B. Hale  
 Spring wheel. A. G. Ramage  
 Stapling machine. E. M. Cobb  
 Stapling machine. L. Koppel  
 Steam engine. J. F. Murphy  
 Steam producer. I. H. Boyer  
 Steel containing titanium. Production of. A. J. Kossel  
 Stencil frame. J. S. Duncan  
 Still. J. J. Brennan  
 Stilt. Spring. A. Hanson  
 Stirrup and hammock spring. S. P. Foster  
 Stock fountain. J. Falk  
 Stone and other materials. Machine for sizing and cutting. W. F. Currier  
 Stone. Means for making artificial building. O. B. Kaiser  
 Straw binder tucker. C. B. Wanamaker et al  
 Street or station indicator. Electric controlled. A. J. Clark  
 Stump puller. W. A. Mushatt  
 Stumps. Facilitating the removal of roots of. M. A. Fry  
 Swing. Centrifugal. R. H. Casswell  
 Switch operating device. Slip. L. Dunn  
 Table leg. G. Kianke  
 Tablet holder. W. N. Gundersen  
 Tag. A. E. Ellis  
 Tapping device. H. Hottinger  
 Target trap. C. M. Ketcham  
 Tea packing machine. W. H. Scott  
 Teeth and forming the same. Attachment for natural. J. P. Carmichael  
 Telephone booth. M. C. Turner  
 Telephone call meter. C. T. Bradshaw  
 Telephone exchanges. Multiple switchboard for. M. G. Kellogg  
 Telephone lines. Bridging connector for. M. C. Turner  
 Telephone lines. Signaling system for party. J. L. McQuarrie  
 Telephone sets. Inclosing case for. F. R. McBerty  
 Telephone transmitter or audiphone receiver. H. G. Pape  
 Tellurian. E. J. Seever  
 Terminal connector. J. Opitz  
 Thermostatic control. E. Thomson  
 Thread cutter for spools. H. H. Butler  
 Ticket delivering machine. H. H. Cummings  
 Ticket stamping and delivering machine. 3 pats. H. H. Cummings  
 Tilting gate. C. H. Lovering  
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 Tire armor. J. Coan  
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 Tire. Vehicle. J. Christy  
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 Torpedo expulsion valve. J. Barraja-Frauenfelder  
 Towel rack. Roller. J. C. Christen et al  
 Towel wringing device. Hot. J. Girard  
 Trains. Device for transporting passengers to and from moving. F. S. See  
 Tramway line and railway line at level crossings. W. J. Hollick  
 Transformer. W. S. Moody  
 Trap. C. A. Murphy  
 Trolley stand. J. Zielinski  
 Trolley wheel. G. W. Jobe  
 Truck. Cast steel car. A. Lipschutz  
 Truck. Piano. C. F. Hawk  
 Trunk. Wardrobe. F. H. Parkhurst  
 Truss. G. C. Abraham  
 Truss. J. H. Campbell  
 Tubular articles. Making. G. W. Lee  
 Turbine. D. C. Garraway  
 Turbine. J. Stumpf  
 Turbine and controller mechanism therefor. J. Wilkinson  
 Turbine bucket wheel. J. Wilkinson  
 Turbine. Elastic fluid. J. G. Callan et al  
 Turbine. Elastic fluid 2 pats. W. L. R. Emmet  
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 Turbine governing mechanism. W. L. R. Emmet  
 Turbine shaft packing. J. Wilkinson  
 Turbine. Steam. 2 pats. J. Stumpf  
 Turbines. Governing mechanism for elastic fluid. E. Thomson  
 Turbines. Governing mechanism for elastic fluid. W. L. R. Emmet

Turbines. Operating. J. G. Dornbier  
 Turbines. Stop mechanism for elastic fluid. J. G. Callan  
 Typewriter attachment. C. F. Washburn  
 Type writing machine type bar. G. Riebe  
 Type writing machine type bar. F. A. Peterson  
 Universal coupling. H. C. Chase  
 Universal indicator. H. M. Willis  
 Valve. C. W. A. Koelkebeck  
 Valve. Pressure regulated supply. E. D. Hodson  
 Valve. Supply. E. A. Marsh  
 Vehicle. Amusement. R. F. Rice  
 Vehicle brake. A. A. Ball, Jr  
 Vehicle brake. H. E. Martin  
 Vehicle braking and starting device. Combined. J. de Mazaraki  
 Vehicle wheel. L. G. Langstaff  
 Vending machine. Coin operated. J. A. Rule  
 Veneer cutting machine. W. R. Bright  
 Wagons, &c. Loading apparatus for. L. Kniffen  
 Wall. J. A. Ferguson  
 Wall construction. J. C. Davidson  
 Walls, partitions and the like. Method of and means for constructing. J. G. Stidder  
 Washing apparatus. O. C. Prasse  
 Washing machine. G. H. Wisner  
 Washing machine. J. G. Kincaid  
 Washing, wringing, mangling and other similar machines. Roller for. G. W. Robinson  
 Watch. A. Schweizer-Schatzmann  
 Watch cover and holder. A. L. Shonfield  
 Water heater. J. K. McLaughlin  
 Water jacket. F. H. Tryon  
 Water trap. C. Martineau et al  
 Water tube boiler. 2 pats. H. Del Mar  
 Waterproofing buildings, &c. A. A. Gross et al  
 Weigher. Automatic. J. S. Herron  
 Weighing instrument. H. M. Willis  
 Well drilling apparatus. S. N. Hall  
 Well jack. Oil. G. B. Sessions  
 Well. Terra-cotta tile. J. Elliott  
 Wheel. A. Freschl  
 Wheel rim and tire fastening. R. H. Atcheson et al  
 Whiffletree hook. H. C. Scott  
 Whipsocket. J. D. Shimer  
 Winding machine. Ball. A. T. & G. H. Saunders  
 Window. F. Flaschberger  
 Window and window screen fastener. Storm. F. O. Hermance  
 Window frame and sash. H. Staib  
 Woodworking machines. Combined presser foot and guard for. H. H. Stoer  
 Wrench. J. T. Urbach  
 Writing machine. E. B. Hess

## DESIGNS.

Badge. S. D. Parker  
 Basket, coffin or similar article. C. F. Wetmore  
 Crib. Christmas. F. Willenbrink  
 Fabric. Embossed. L. M. Musliner  
 Fabric. Textile. 5 pats. S. L. Crownfield  
 Fruit bowl. B. W. Jacobs  
 Jug or similar article. 3 pats. C. J. Noke  
 Jug or similar article. J. Slater  
 Lampshade. W. A. Hogan  
 Pen holding receptacle. Fountain. F. A. Weeks  
 Show case. J. T. Robin  
 Suspender box. A. Coleman

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Adding machine. A. Macauley  
 Advertiser. Mechanical. B. F. McFarland et al  
 Air brake. J. P. Kelly  
 Air brake air supply apparatus. E. B. Allen  
 Air brake apparatus. H. F. Bickel  
 Air brake gasket replacing tool. G. J. Pilger  
 Album for collecting post cards. H. Quensel  
 Animal trap. M. Kroft  
 Armature coils. Frame for winding. L. R. R. De Plarquet et al  
 Automobile headlight control. J. S. Detrick  
 Awning side attachment. W. Armstrong  
 Badge and watch guard. J. S. Martin et al  
 Baking pan for pastry crusts. M. C. Haddock  
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 Baling press self feeder. C. B. Bower  
 Band cutter and feeder. H. W. Smith  
 Barber's pole. W. T. Cobb  
 Bearing. Roller. W. H. Russell  
 Bed bottom. Spring. J. G. Smith  
 Bed bottom. Spring. G. A. Mellon  
 Bed. Folding. W. C. James  
 Bed. Folding. J. F. Wilmot  
 Bed. Infant's. J. Gamber et al  
 Bedstead. H. F. Babcock  
 Belt shifter. D. McDonald  
 Bending machine. C. H. Closterman et al  
 Bevel and compasses. Combined. H. Tatum  
 Bicycle. Aerial. F. G. Bonifis  
 Bicycle attachment. L. De Rome  
 Binder. Loose leaf. W. J. Schultz  
 Block. A. B. Tarbox  
 Boiler. C. Vanderbilt  
 Book back. Solid. A. C. Hafely  
 Bottle closure. L. Lawton  
 Bottle closure. 2 pats. H. S. Brewington  
 Bottle closure. G. Kirkegaard  
 Bottle. Coupon. I. H. Vendig  
 Bottle fastener. P. M. Peterson  
 Bottle holder. C. Richter  
 Bottle. Non-refillable. G. De Grey  
 Bottles. Device for securing corks in. F. W. Schroeder  
 Bottles, jars, and similar vessels. Closure for. S. C. Kindig  
 Bottles, jars, or other vessels. Self-fixing protective covering for. M. G. Ollivier  
 Bowling alley. H. B. Lahr  
 Box covering machine. W. A. Cardy  
 Box lid holder. G. Mueller  
 Bracket. A. H. Bliss  
 Bracket. J. S. Detrick  
 Brake beam. W. Stevenson  
 Brake beam fulcrum. H. W. Frost  
 Brake shoe. 2 pats. F. P. Collier  
 Brewers' and distillers' sloop. Treating. C. J. Roher  
 Brick for chimneys. R. P. Weber  
 Brick machine. P. Thomaun

Bridle bit. H. Schlueter  
 Briquet press. J. J. Crawford  
 Brush. R. E. Williams  
 Brush. S. D. Purdy  
 Brush. Fountain paint. C. H. Abbott  
 Brush with detachable handle. Bath. B. D. Knickerbocker  
 Bubble pipe. Soap. J. Blonde  
 Bucket. Clam shell. G. H. Williams  
 Bucket. Clam shell. M. J. Purtle  
 Bucket. Clam shell. 2 pats. R. W. Kalenbach et al  
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 Burial casket. R. R. Cramer  
 Batter package. S. M. Brown  
 Button. Collar. H. T. Murphy  
 Button for gloves, &c. Detachable. H. Kerngood  
 Cabinet. Commodity. J. H. Boye  
 Cables. Fair lead for hoisting. S. L. G. Knox et al  
 Calculating machine. H. A. Hensley  
 Calculating machine. F. Trinks  
 Calculating machine. C. A. Meilicke  
 Can closure. 2 pats. J. J. Moser  
 Can heading machine. J. Brenzinger  
 Car bolster. J. B. Barnes  
 Car bolster. Railway. S. Otis  
 Car brake. H. T. Brown  
 Car brake. C. B. Mead et al  
 Car coupling. Automatic. H. L. Blue  
 Car door safety guide bracket. E. J. Kates  
 Car fender. E. Tallaksen  
 Car seat. E. G. Budd  
 Car stake. C. F. Flemming  
 Car step holder. J. Edwards  
 Cars. Safety system for motor propelled. J. A. Miller  
 Carbureter. A. Akeson  
 Carbureter for explosive engines. W. J. Steinbrenner et al  
 Cardboard cutting machine. Oval and round. D. T. McCall  
 Cash register. Change making. W. H. Collier  
 Caster attachment for adding machine stands. A. Hendricks  
 Caster. Guarded. A. F. Hassy  
 Cement post mold. J. T. Wilson  
 Chain. C. W. Levalley  
 Chair. A. Wanner, Jr  
 Cheese cutter. A. B. Roach  
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 Chimney. C. Weber  
 Chimney top. J. F. Spatz  
 Chloroform dropper. F. Wachter  
 Chuck. E. A. Noll  
 Chuck. J. F. Buckley et al  
 Chuck. Scroll. A. E. Church  
 Cigar protector. F. H. Whomes  
 Cigarette roller. O. F. Hammer  
 Clasp. F. Hirsh  
 Clutch. J. J. Campbell et al  
 Clutch. Friction. H. S. & C. E. Glenn  
 Clutch operating mechanism. C. L. Taylor  
 Clutch release means. L. J. Hinde  
 Collar shaper. Steam heated. D. C. Porter et al  
 Column support. F. M. Sisco  
 Comb. E. C. Macartney  
 Comb cleaner. E. Layton  
 Combs. Making. W. M. Stone  
 Composite block and making same. F. W. Dunnell  
 Concentrator. M. P. Boss  
 Container top. J. B. Williamson et al  
 Conveyor. F. F. Landis  
 Conveyor system. I. S. Merrell  
 Cooking utensil. R. A. W. Krampitz  
 Cooler. A. P. S. & P. Wohipart  
 Copying press. Rotary. C. E. Adamson  
 Corks. Attaching extractors to. W. H. Smith  
 Corn hulling, degerminating, and hominying machine. M. L. Mowrer  
 Cotton chopper. A. R. Maret  
 Couch or sofa and bed. Combined. J. H. Hagedorn  
 Covers of receptacles. Apparatus for applying liquid to. W. C. Buhles  
 Crank wheel balancing means. C. T. Westlake et al  
 Crib. Folding. L. Dejonge, Jr  
 Crushing mill. M. P. Boss  
 Cultivator. 2 pats. L. E. Waterman  
 Cultivator. W. A. Gillettine  
 Cultivator beams. Device for securing shovel standards to. A. Lindgren  
 Cultivator. Beet. A. Larsen  
 Current motor. Alternating. J. O. Heinze, Jr  
 Current translating device. Alternating. L. H. Thullen  
 Curtain fixture. Adjustable. A. L. Perra  
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 Cutting tubular bodies. Machine for. E. J. Logan  
 Dental disk shield. W. F. Green  
 Dental handpiece. C. L. Alexander  
 Display frame. G. E. Leigh et al  
 Ditching machine. F. R. Sammis  
 Dividers. H. C. Rickheit  
 Door. J. A. Meyer et al  
 Door check and closer. G. T. Sheets  
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 Door hanger. D. D. Miller  
 Door opener. S. T. Stevens et al  
 Draft equalizer. F. Humphreys  
 Drier. F. T. Johnson  
 Drier. 2 pats. A. T. Collins  
 Drying chamber. A. Schroder  
 Dust collector. Gravity. D. Deneen  
 Dye and making same. Vat. K. Schirmacher  
 Electric conductor union. F. W. Sorg  
 Electric indicator. G. S. Eble  
 Electric switch. W. J. O'Leary et al  
 Electrical circuit controlling device. E. O. Schweitzer  
 Elevator hatchway closure. J. W. McGhee  
 Elevator load limit mechanism. J. R. Willcox  
 Embossing or creasing machine. E. E. Spencer, Jr  
 Excavator. J. G. Fairbanks et al  
 Excelsior cutting machine. W. H. Niemeyer  
 Eyeglass holder. E. B. Meyrowitz  
 Eyeletting envelopes, tags, or the like. Machine for. C. H. Andrews  
 Feed water heater. M. A. Moffat  
 Feeding trough. S. Walter  
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 Fence post. C. E. Robinson  
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Fencing tie. Wire.....J. J. Morse  
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Filaments of viscose or similar material. Spinning head for forming.....M. Waddell  
Filter.....C. H. Loew  
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Fishing hook.....W. Cooper  
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Fluid pressure motor. Compound.....J. P. Magney et al  
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Gas regulator for incandescent lights.....H. Schupplisser  
Gate.....A. E. Cullem  
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Gearing.....A. Damians y Rovira  
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Liquid receptacle head filler.....D. Landau  
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Paper cutting machine.....J. G. Hardie  
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Paper trimming and slitting machine.....A. Aldrich  
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Paving or flagstone.....S. W. Lerch  
Pelt stretcher. Universal.....A. Hirsch  
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Pine banger.....J. Crawford  
Pivot connection.....F. H. Richards  
Planing machine. Metal.....H. Robinson  
Planter. Corn.....L. E. Waterman  
Planter. Seed.....D. M. Pearce  
Plate cooling and conveying apparatus.....L. E. Edgar  
Plates to cylinders. Means for fastening.....H. F. Bechman  
Plow and seeder.....F. Thurrid  
Plow. Wheeled.....2 pats.....L. E. Waterman  
Pneumatic economizer and air injector.....E. Hoxie  
Power transmission and distribution. Electric.....J. Kruswijk  
Power transmission mechanism. Frictional.....I. Larsen et al  
Precious metals. Apparatus for recovering.....E. I. Garvin  
Presses. Form for cylinder.....J. H. Matthews  
Printer's block.....J. Kyle  
Printing device.....P. T. Hahn  
Printing press gripper.....F. I. Macauley  
Printing press inking apparatus.....H. F. Bechman  
Printing press. Rotary.....R. F. Berry  
Propeller for marine vessels.....J. Dela Mar  
Pulleys. Yoke for split sheet metal.....E. T. Shepard  
Pulverizing mill.....S. R. Krom  
Pump.....P. H. Dels  
Pump. Centrifugal.....R. Pltman  
Pump. Electrically driven.....H. F. Gurney  
Pump piston and packing therefor.....W. M. Maloney  
Punching machine.....C. Weatherston  
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Rail bond.....E. W. Robinson  
Rail bond compressor.....C. H. Osland  
Rail joint.....T. R. Leach  
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Railway gate. Electric.....A. Knobel  
Railway signal.....J. S. Jeffery  
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Railway switch.....E. Warman  
Railway switch.....L. T. Weaver  
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Relay.....R. H. Manson  
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Rolling metal plates.....T. H. Mathias  
Rotary engine.....W. A. Allan  
Rotary engine.....J. P. Shepard

Rotary engine.....F. D. Blake  
Rotary engine.....A. M. A. Sponnek-Mayer  
Rotary explosive engine.....W. M. Jewell  
Rubber from rubber waste. Recovering.....W. A. Koneman  
Rubber waste. Treating vulcanized.....W. A. Koneman  
Rule marker.....J. L. Gastineau  
Sad iron.....L. Rosenbaum  
Safe, vault, &c.....T. H. Holstein  
Safety pin.....C. W. Engel  
Sash holder. Window.....W. F. Evans  
Sash lock.....S. R. Holdman  
Sash lock. Window.....T. T. McEntee  
Sash. Metal window.....C. W. Ecker  
Saw, square and bevel. Combined.....A. M. Bowes  
Sawmill dog.....C. W. White  
Scale. Platform.....M. H. Winslow  
Scale. Price.....W. E. Craft  
Scraper.....J. F. Delano  
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Seal lock.....C. G. Shepherd  
Seal. Self locking.....W. F. Harris  
Seat back. Portable knockdown.....J. L. Amann  
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Seed testing apparatus.....W. Ulbrich  
Seeding machine.....L. E. Waterman  
Self acting switch.....W. H. Taylor  
Settee or chair.....A. P. Boyer  
Sewer pipe.....F. E. Shaw  
Sewing machine embroidering attachment.....R. L. Rodman  
Sewing machine. Filled sack.....M. C. Ellison  
Sewing machine table.....J. H. Thompson  
Sewing machine tucker.....C. P. Oldham  
Shade roller. Spring.....F. M. Vickery  
Shaft support.....H. W. Davis  
Sharpener. Drill.....C. W. Atkinson  
Sharpener. Knife.....W. M. Kellogg  
Show window and show case.....H. Brandenberger  
Side register for sheet folding and other machines.....C. A. Sturtevant  
Sifter and bucket. Combined ash.....C. W. Conradt  
Sifting machine spout.....O. Grisamore  
Sign. Advertising.....M. D. Batchelder  
Signalling system. Train.....J. Gerard  
Silk. Manufacture of imitation.....E. Schramm  
Siphon closet.....reissue.....B. O. Tilden  
Skate. Motor roller.....H. Beauford  
Skate. Roller.....C. G. Hoerle  
Stack adjuster.....C. O. Anderson  
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Speed changing mechanism.....C. C. Williams  
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Station indicator.....J. T. Shofner  
Steam boiler.....J. A. Doornberger  
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Stove gate. Detachable adjustable.....I. G. Chatfield  
Strip cutting machine.....A. C. Townley  
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Sulfuric anhydrid. Making.....F. Kiersch  
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Switchboard.....W. C. Marchant  
Syringe. Vaginal.....J. T. McCarthy  
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Telegraphy. Electric.....I. Kitee  
Telephone call list and memorandum slip attachment.....A. L. Smith  
Telephone exchanges. Calling device for.....F. A. Lundquist  
Telephone.....2 pats.....G. E. Van Every  
Telephone or other line supporting post.....C. T. Mason  
Telephone receiver.....C. T. Mason  
Telephone switching apparatus.....R. A. Walton  
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Telephone transmitter mouthpiece guard.....G. E. Grimm  
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Tibill support.....D. H. Loveless  
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Tile mold.....W. P. Meeker  
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Tower or dish cloth holder.....J. W. Brown  
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Trace carrier.....A. M. Craig  
Train control system.....A. Sindh  
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Trolley hanger.....T. Price  
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Truck. Locomotive.....W. Dalton  
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Turbine.....H. S. Scott et al  
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Turbine. Steam.....I. W. Smith  
Type writer ribbon feed.....W. H. Sherwood  
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Type writing machine.....C. W. Walker  
Vaginal irrigator.....T. W. Heuston

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Valve gear for explosive engines.....F. B. Ellis  
Valve gear for explosive engines.....A. C. Menges  
Valve gear. Pressure actuated.....W. H. Collier  
Valve lubricator. Engine.....D. Morehouse  
Valve mechanism. Rotary.....E. C. Goddard  
Vehicle lock.....R. Conover  
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Vehicle wheel.....W. S. White  
Vending machine.....P. E. Berger  
Vending machine.....A. Merckens  
Veneer drier.....E. F. Smith  
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Wagon. Dumping.....P. Blatt  
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Wagon wheel.....I. T. Hurd  
Wagons for painting. Device for supporting.....P. C. Ketterer  
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Washing machine.....G. W. Dungan  
Watch hand remover.....E. N. Parker  
Water cooling apparatus.....A. P. Smith  
Water ozonizing apparatus.....M. Otto  
Water purifying and regulating apparatus.....J. W. Gamble  
Water service.....W. C. James  
Water tube boiler.....A. J. Raynor  
Water tube boiler.....H. Del Mar  
Water wheel.....C. S. Dean  
Waterproofing composition.....I. Wessel  
Wave motor.....J. A. McManus  
Weeder.....J. H. Lamdriv  
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Well casing head. Oil.....I. R. Fddv et al  
Wells. Valve adjuster for oil.....F. Matthews  
Wheel rim.....H. B. Williams  
Winding drums. Rope fastening for.....W. Ferris  
Wind wheel.....E. Q. Fuller et al  
Windmill lubricator.....C. A. Hoff  
Window operating and securing mechanism.....E. P. Sperry  
Window screen.....G. Holden  
Wire fabric machine.....J. W. Snedeker  
Wire stretcher.....J. A. Tygart  
Woodworking mechanism.....T. W. Lovatt et al  
Wool scouring machine.....T. A. Jones  
Wrench.....C. Liaci  
Wrench.....D. L. Rooker  
Wrench.....W. H. Glover  
Wrench.....B. F. Kline  
Wrench.....J. D. Ryan  
Wrench.....W. Ruhl  
Writing machine.....E. B. Hess

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Billiard table.....2 pats.....W. C. Huss  
Casket trimming.....W. E. Stevens  
Dental cabinet.....W. G. Hullborst  
Door for feed water heaters and similar apparatus.....M. K. Bowman  
Fabric. Textile.....2 pats.....S. L. Greenfield  
Glass cigar and ash tray.....E. Schwab  
Globe support.....C. E. Waldeck  
Mirrors, brushes and similar articles. Back for hand.....2 pats.....H. B. Reach et al  
Percolator. Beverage.....G. F. Savage  
Seat end.....H. J. Bell  
Seat end.....E. G. Rudd  
Seat end.....T. R. Kilburn  
Spoons, forks, or similar articles. Handle for.....F. Hillbom  
Spoons, forks or similar articles. Handle for.....F. Habensack  
Stove.....F. J. Frey  
Teapot or similar article.....H. Hillbom  
Trivet.....C. L. Berger  
Wall pocket or music rack.....C. A. Flanagan

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Addressing machine. Envelop and the like.....J. J. Braun  
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Air brake. Automatic.....F. J. R. Wagner  
Alarm lock.....A. Schoenman  
Amalgamator. Mercurial.....B. Baldwin  
Animal trap.....M. E. Mixson  
Apron.....W. H. Hatton  
Aprons. Automatic guide for endless.....A. Beas  
Automobile controlling mechanism.....B. A. Gramm  
Automobiles and the like. Automatic circuit making and breaking device for.....A. L. Riker  
Baby holding and walking device.....P. T. Ritter  
Band. Claspings.....S. M. Danielson  
Banjo.....F. I. Bacon  
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Bed. Extensible sofa.....F. M. Tinkham  
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Binder frame.....W. I. Waters  
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Boiler with superheating tubes.....W. Schmidt  
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Bottle. Non refillable.....G. R. Howey  
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Box.....J. Sutherland  
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Brake actuating device..... J. Post  
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 Brake mechanism..... E. O. Flichinger  
 Brassieres..... G. M. Poix  
 Brick. Knife for striking off J. Jackson et al  
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 Brooder. Chicken..... G. S. Summers  
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 Buckle. Wrought metal..... C. S. & A. S. Huntington  
 Building construction..... N. W. Harris et al  
 Burglar alarm..... I. Watkins  
 Burlap basket..... J. D. Kenschler  
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 Cabinet. Compartment..... R. W. Sturr  
 Calculating machine..... G. H. Sears  
 Calculating or computing machine..... J. Gruner  
 Calendar. Perpetual..... J. Guidinger  
 Cameras. Reversible back for photographic  
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 Can drying apparatus..... M. Leitch  
 Can loading and counting machine..... J. G. Hodgson  
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 paratus..... J. G. Hodgson  
 Car. Combined stock and freight..... E. Wyatt  
 Car coupling..... W. Slayden  
 Car coupling. Automatic..... S. P. Bush  
 Car door lock..... C. M. Caranan  
 Car door operating mechanism..... J. C. Herrmann  
 Car. Dump..... S. Ous  
 Car end brace..... H. W. Wolff  
 Car end bracing..... H. W. Wolff  
 Car frame. Railway..... W. F. Kiesel, Jr.  
 Car grain door..... L. J. Mighell  
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 Car. Stock..... C. W. McKeeen  
 Cars. Metallic underframe for passenger..... A. Stucki  
 Carbureter. Explosive engine..... J. B. D. M. Malezieux  
 Card. Coin..... F. W. Stack  
 Carpet fabric..... C. C. Stewart  
 Carrier system..... J. A. Suerth  
 Cash register..... L. Cooney, Jr.  
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 Casting anode plates. Mold for R. Truswell  
 Cement mold..... W. F. McNamire  
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 Chair back. Adjustable..... M. F. Gleason  
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 Clamp..... F. E. Walden  
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 Clothes pin..... J. M. McChesney  
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 Clutch. Friction..... J. G. Babio  
 Coats. Stay plate for..... J. A. Vaughn  
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 Coffee roaster..... J. S. Miller  
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 Collapsible box or crate..... W. B. Price  
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 Commutator..... W. L. Waters  
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 Condiment holder..... W. J. Bain  
 Controlling apparatus. Irreversible..... L. E. Remondy  
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 Curtain support. Window..... W. P. Powell  
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 Duster..... H. A. Hayden  
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 Metal coiling and straightening apparatus..... W. F. Conklin  
 Metal straps. Finishing and straightening  
 flat..... W. F. Conklin  
 Metals from their ores. Extracting..... C. R. Arnold  
 Metallurgical apparatus..... E. A. Touceda  
 Metallurgy..... E. A. Touceda  
 Meters. Bill delivery mechanism for..... R. W. Gallagher  
 Milk. Apparatus for the distribution of whey  
 or skimmed..... J. J. Daniel  
 Mine cages and the like. Apparatus for mak-  
 ing frames for..... P. Thielmann et al  
 Mining and washing clay, kaolin, &c. Simul-  
 taneously..... M. Wanner  
 Mining apparatus. 2 pats..... A. McDougall  
 Mining and beveling machine..... A. Cadorette et al  
 Molding apparatus..... M. J. Hewlett  
 Mortar gage..... G. F. Fisher  
 Motors. Apparatus for propelling rotary..... J. M. Small  
 Music holder and tuner..... 2 pats..... E. S. Stem  
 Musical apparatus. Mechanical..... E. S. Votey  
 Musical instrument..... O. H. Newman  
 Musical instrument player. Portable..... E. S. Votey  
 Napkin holder..... J. Simpson  
 Nut lock..... W. N. Keen  
 Nut lock..... J. T. Taylor  
 Nut lock..... N. Howell  
 Oil burner..... W. F. Hogan  
 Oil cap..... H. C. Vaughn  
 Oil action. Electric..... C. J. Landin  
 Oven. Baker's..... W. H. Perry  
 Package or mail despatching system..... A. F. Johnson  
 Padlock..... Y. Q. Cardwell  
 Paint or composition. Non-corrosive and anti-  
 fouling..... F. E. Dunnett  
 Paint remover..... G. Michaelis  
 Painting machine. Card..... J. W. Stocker  
 Pans and the like to prevent burning. Attach-  
 ment for..... M. T. Roemer  
 Paper bag machine..... G. Hartman  
 Paper knife. Cigar cutting..... H. H. James  
 Paper perforating machine..... E. Southworth  
 Paper roll adjustment..... F. B. Davidson  
 Paper splitter..... W. J. Lupton  
 Paper tray..... 2 pats..... F. B. Davidson  
 Paper tray or receptacle..... H. P. Shotts  
 Parcel bundling machine..... G. H. Adthead  
 Partition structure..... A. R. Speer  
 Pattern chart..... G. F. Parker et al  
 Pen filling device. Fountain..... H. B. Smith  
 Pencil..... 2 pats..... J. A. Stahle  
 Photographic developing apparatus..... A. W. McCurdy  
 Pianissimo device..... C. Morgan  
 Pictures. Protective gate for moving..... L. Bories  
 Pile fabric. Woven..... T. B. Dornan  
 Piling. Sheet..... G. Webster  
 Pillows, bolsters, and cushions. Slip for..... F. Coakley  
 Pillows, bolsters, or cushions. Slip or case for..... F. Coakley  
 Pins. Safety attachment for scarf..... E. L. Schreiber  
 Pipe..... L. E. Dare  
 Pipe cutter..... L. Leyea  
 Pipe grapple or puller..... H. B. Childress  
 Pipe spacer and holder. Heating..... W. P. Hussey  
 Pipes and other articles. Machine for turning..... C. H. McCready  
 Pitcher. Syrup..... M. Bradford  
 Planters. Valve mechanism for seed..... A. C. Lindgren  
 Plaster composition..... C. R. Harris et al  
 Plow..... T. W. Marcum  
 Plow..... L. A. Lohrke  
 Plow..... R. R. Hayward  
 Poison indicator..... P. H. Jones  
 Polishing machine..... D. McCance  
 Pool table. Automatic registering..... G. Kindling  
 Postal cabinet..... R. O'Reilly  
 Powder. Machine for making grains or flakes  
 of..... C. Dobbs et al  
 Presses. Paper guide for..... F. B. Davidson  
 Printing. Composition for preventing set-offs  
 in..... 4 pats..... G. S. Duncan et al  
 Printing device..... A. Holtn  
 Printing machine..... W. Scott  
 Printing machine. Plate..... G. H. Kendall  
 Printing on tin plates or the like. Machine for..... G. C. H. Wichmann et al  
 Printing. Poster and color..... C. S. Heermance

Projectile..... J. F. Meigs et al  
 Pulley. Expandable..... E. E. James  
 Punching bag multiple ball bearing support..... J. F. Frazee  
 Punching bag support..... J. F. Frazee  
 Quick acting wrench..... F. Norwood  
 Rabbit or poultry hatches or the like. Means  
 for transporting..... J. Parker  
 Radiator valve..... E. H. Packard  
 Rails. Device for preventing the creeping of  
 ..... G. H. Prentice  
 Rails. Means for securing..... D. F. Vaughan  
 Railway brake adjuster..... R. E. Brooks et al  
 Railway cattle gate..... C. R. Larkin  
 Railway cattle guard..... I. J. Ball  
 Railway signaling..... L. H. Thullen  
 Railway signaling lantern..... T. L. Moore  
 Railway switch..... C. F. Comor et al  
 Railway switch structure. Safety..... H. R. Luther  
 Railways. Alarm signal arrangement for use  
 in connection with..... R. W. Clery  
 Railways. Safety system for operating..... W. H. Dammond  
 Refrigerator..... L. Borden  
 Riveting device..... W. T. Gordon  
 Rock drilling machine..... C. M. Walker  
 Rotary engine..... G. S. MacDonald  
 Rotary engine..... J. L. Strickland  
 Rotary engine..... W. Lister  
 Rotary motor..... P. Ellis  
 Rubber balloon bag..... H. B. Faber et al  
 Rubber footwear. Apparatus for manufactur-  
 ing..... M. C. Clark  
 Rubber footwear. Manufacture of..... M. C. Clark  
 Ruler. Parallel..... I. M. Hofstad  
 Saddles and back bands. Pad for girth..... A. G. Eichhorn  
 Safety pin..... J. C. Traill  
 Safety seat..... W. H. A. Lewis  
 Sand mixer..... W. G. Stockham  
 Sash holder and fastener..... G. H. Arkridge  
 Sash lock..... J. S. Packer  
 Sash lock..... D. Wilkie  
 Sash lock..... R. E. Harryman  
 Saw sharpening machine..... J. M. Waddell  
 Saw swage and shaper..... W. Barkla  
 Sawing machine..... S. J. Gray et al  
 Scale..... J. W. Hughes  
 Scale attachment. Automatic..... G. Hoepner  
 Scale. Weighing..... E. N. Gillfillan  
 Screw. Locking..... F. J. Herdle  
 Seed hullers. Cylinder knife for cotton..... M. W. Faherty  
 Seesaw and roundabout..... J. Mueller  
 Shade and curtain bracket. Adjustable  
 window..... A. Dennis  
 Shade fixture..... S. Stewart  
 Shade for artificial lights. Composite..... O. A. Mygatt  
 Shade roller bracket..... H. S. Dunbar  
 Shaft coupling..... H. C. Hart  
 Shears..... W. P. Spragg  
 Sheet separating apparatus 2 pats..... A. B. Dick  
 Shingle gage..... W. W. Jones  
 Ship's coarse recorder..... F. O. Tibbets  
 Shock absorber..... O. E. Vestal  
 Show window fixture..... O. Wagner et al  
 Sign. Electric..... W. Gierth et al  
 Signaling system..... J. B. Struble  
 Silk. Machine for making watered..... J. J. Cavagnaro  
 Skate. Roller..... O. W. Everett  
 Skate roller..... O. W. Everett  
 Skiving machine..... C. H. Bayley  
 Skiving machine..... E. F. Davenport  
 Sled..... W. L. Holloway et al  
 Sleeve adjuster..... C. W. Hutchinson  
 Sliding bar..... W. C. Horner  
 Slubbing, intermediate and roving and like  
 frames. Building motion of..... J. Heywood  
 Smoke bell hanger..... S. S. Myers  
 Snout piercing tool..... D. Falconer  
 Soap holder..... F. W. Wilson  
 Sounding board bridge..... N. M. Ong  
 Spark arrester..... O. S. French et al  
 Speed mechanism. Variable..... A. W. Pupke  
 Sponge. Scrubbing..... F. S. Harrison  
 Spring wheel..... E. V. Hartford et al  
 Station indicator..... L. Grillon  
 Stay bolt..... G. S. Thompson  
 Steam boiler..... F. J. Hickey  
 Stools. Back for folding..... G. B. Freeman  
 Stove, furnace, and the like..... P. Tiddick  
 Stove. Kerosene vapor..... J. A. Mathes  
 Stovepipe coupling..... H. B. Eager  
 Supporting clamp. Universal..... H. D. Jones  
 Surgical appliance..... A. P. Barlow  
 Surgical implement..... A. C. Kellogg  
 Switch locking and tripping device H. M. Acly  
 Switch mechanism..... H. A. Thomson  
 Switch signal..... I. W. Hicks  
 Tackle block..... A. P. Brown  
 Tamping bar and post hole pick..... E. E. Whitehead  
 Tannin. Apparatus for the extraction of..... L. Castets  
 Tap and nut wrench. Ratchet..... F. G. Marbach  
 Tea strainer and infuser..... F. N. Denison  
 Telegraph system. Wireless..... L. De Forest  
 Telegraphic circuits. Transmitting key for..... I. Kitsee  
 Telegraphic sending device..... I. Kitsee  
 Telegraphic transmitting key..... I. Kitsee  
 Telephone..... T. J. Merryman et al  
 Telephone relay..... E. E. Clement  
 Telephone transmitter..... W. W. Dean  
 Telephone transmitter supporting arm..... S. A. Beviland  
 Telephony..... 2 pats..... I. Kitsee  
 Thermo electric couple..... H. E. Heath  
 Thermometer case. Clinical..... J. F. Myers  
 Thermometer shaking apparatus..... F. Grosche  
 Tie plate..... 2 pats..... D. F. Vaughan  
 Tilting furnace..... J. C. Cromwell  
 Tilting platform..... J. E. Briggs  
 Timepieces. Synchronizing mechanism for..... A. L. Hahl  
 Tire..... W. N. Wright et al  
 Tire cover..... J. P. Gordon  
 Tire cover..... J. P. Gordon  
 Tires. Implement for putting on pneumatic..... P. F. Pilliner  
 Tobacco pipe..... F. A. Stegner  
 Tool shank..... A. Schulze  
 Top spinning..... M. L. Powers  
 Torpedo. Railway signal..... F. Dutcher et al



Torpedo. Track... 2 pats. W. D. Jackson  
Toy... Mechanical... C. A. Lewis  
Toy railway and telegraph pole... E. R. Ives  
Trace... J. Anderson  
Track brake... T. W. Fitch, Jr.  
Transmitter support... S. A. Beyland  
Trousers holder and presser... K. Nishimoto  
Truss... A. P. Barlow  
Tug. Hame... A. J. Smith  
Turbine engine... L. Hachenberg  
Turbine nozzle. Elastic fluid... J. Wilkinson  
Turbine. Steam... A. I. Senior  
Turn table... J. Schnell  
Underwaist... E. H. Horwood  
Upholstery... E. M. Hulse  
Vacuum device... S. S. Leonard  
Valve and seat. Pneumatic... G. P. Brand  
Valve for engines. Rotary... F. T. Liggett  
Valve for heating systems. Relief...  
... A. McGonagle  
Valve gear. Engine... J. Hanser  
Vault. Burial... T. A. Stevenson  
Vault. Portable burial... W. Parry  
Vehicle. Motor... A. Frode  
Vehicles. Carburetor control mechanism for  
motor... C. Schmidt  
Vending device. Coin controlled...  
... G. W. Meredith  
Vending machine... 2 pats. J. E. Packard  
Vending machine. Cigar... 2 pats.  
... G. W. Meredith  
Vending machine. Postage stamp  
... M. Delude  
Vent. Receptacle... P. Donaldson  
Vinegar apparatus... C. Weny  
Vise... J. K. Elmer  
Vise. Hand... H. T. Martin  
Voting machine... E. Stacy  
Wagon. Dumping... E. Smith  
Wagon. Dumping... W. O. Long  
Wall packer. Soft metal... J. T. Callanan  
Wardrobe. Portable... A. M. Scherff  
Washing machine... C. E. Mitchell  
Washing machine attachment... C. A. Colby  
Watch. Stem winding... N. Bequelin  
Water closet... B. M. Drawe  
Water gate... A. J. Collier  
Water heater... E. W. Dietzler  
Water heater... C. Porter  
Water purifier. Electric... A. E. Dietrich  
Weather strip... W. H. Etter  
Weight actuated apparatus... E. Puller  
Well tube safety catch... W. A. Shaw  
Wheel... M. Dixon  
Whiffletree... P. Blondell  
Winding machine. Quill or cop... H. Kaufmann  
Window screen... G. W. McFarland  
Window washer's platform...  
... C. N. Christofferson et al  
Wire cage... J. G. Callan  
Wire hoop lock forming device... H. S. Smith  
Wire tightener... I. U. Campbell  
Wooden plate. Compound... H. Buxton  
Woodworking machine... E. W. Lucas  
Woodworking tool... M. Enright  
Wrench... T. W. Jester  
Wrench... 2 pats. H. L. Reynolds  
Yoke center. Neck... G. & F. Aid  
Yoke. Neck... T. J. Woodrow  
Yoke. Neck... J. Miller  
Zinc. Manufacture of sulfid of... G. Ranson

## DESIGNS.

Automobile dash... A. E. Schaaf et al  
Badge... D. Z. Merchant  
Brush back... 2 pats. W. C. Codman  
Burse... M. A. Philbin  
Dish... L. B. Critz  
Fabric. Textile... 5 pats. E. W. Doughty  
Flag... T. K. Sturdevant  
Rubber binding... C. E. Knapp  
Spoons, forks, or similar articles. Handle of  
... S. A. Keller  
Teapot or similar article... M. B. Leete

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## MECHANICAL PATENTS.

Adding machine attachment... C. C. Earnist  
Advertising device... A. Suekind  
Advertising display stand... W. T. Little  
Aerial tramways and the like. Coupling device  
for... J. A. Gyllenberg  
Aethoxy-phenyl-camphoryl imid and making  
same... A. H. C. Heitmann et al  
Alarm signal... R. J. Zorge  
Alloy... W. B. Driver  
Alloy... C. H. Birmingham  
Alloys. Manufacturing zinc...  
... P. & A. Guhrs  
Ammonia from gases. Extracting... R. Brunck  
Ammonia. Regenerating and purifying of...  
... L. Werllin  
Amusement apparatus... J. H. Maguire  
Amusement apparatus. Aquatic...  
... R. A. Fowden  
Animal trap... G. A. Jones  
Arch construction... A. B. Foans  
Antographic register... A. Krauth  
Automatic sprinkler... E. L. Thompson  
Automobiles. Change speed and reversing  
gear for... J. H. R. M. & C. E. Chambers  
Baling press... 2 pats. J. J. Stopple  
Band cutter and feeder... 2 pats.  
... S. Dunkelberger  
Bank. Savings... E. Crapper  
Bath tub... W. Vanderman  
Bath tub seat... reissue... J. P. Enstis  
Bearing... reissue... B. S. Lawson  
Bearings. Roller... T. A. Edwards  
Bed and chair. Combination child's...  
... C. A. Koenig et al  
Bed and table. Combined folding...  
... J. L. Boisvert  
Bed. Davenport... G. A. Mellon  
Bed spring... F. L. Groff  
Bell. Push button... J. R. Kidney  
Belt... J. M. Van Orden  
Belt. Waist... W. C. Spittle  
Belting and preparing and treating the same...  
... G. D. Moore  
Bin... G. W. Hopkins et al  
Blade. Stiffening... W. Webster  
Blast furnace... W. Kemp  
Blind slot fastener. Window... C. P. Ausband

Blind. Apparatus for producing literature for  
the... J. Barr  
Blue. Laundry... R. G. Griswold et al  
Boiler cleaning compound... J. R. Greene, Jr.  
Boiler safety attachment... T. Small  
Bolt and nut lock. Combined...  
... O. E. Quitman, Jr.  
Book mark and page holder... E. L. Reynolds  
Books, papers, or cards. Machine for hold-  
ing, cutting, and ornamenting the edges of...  
... G. Ritchie  
Bottle... R. Sauer  
Bottle... W. F. Smart  
Bottle closure... W. J. Mueller  
Bottle closure... J. C. Kimsey  
Bottle. Non-refillable... I. Brunette  
Bottle. Non-refillable... P. A. Brock  
Bottle stopper... H. B. Jones  
Bottle stopper... A. W. Cordes  
Bottle stoppers and the like. Binder for...  
... F. T. Robinson  
Boxes from hot forming dies. Appliance for  
stripping pasteboard... J. Godfrey  
Bracelet... E. A. Phillips  
Bracelet. Slide... E. F. Presbrey  
Bread and similar cake. Mold used in the  
manufacture of short... S. Scott  
Breeching brace. Harness... W. E. Murray  
Brick. Interlocking... F. P. Allen et al  
Bridge. Rascule... R. E. Newton  
Bridge. Ferry... N. W. Condict et al  
Roller. Gas... H. Gandar  
Brush filling machine. Pneumatic...  
... J. Morrison, Jr.  
Brush. Fountain... W. I. Ferris  
Brush holder... C. A. Harris  
Brush. Tooth... S. E. Babcock  
Ruckle... C. A. Brewer  
Rolling construction... G. H. Dyer  
Bang. Faucet... 2 pats. D. Beebe  
Burner burner for liquid hydrocarbons...  
... P. Uimann  
Burglar alarm... reissue... J. Naser  
Burglar alarm... J. O. Morris  
Burglar alarm. Detonating... L. W. Wade  
Butter cutter... G. Ericson  
Calcining furnace. Carbon... P. P. Nungesser  
Calculating machine... G. E. Schuman  
Candlestick. Miner's... E. L. Weed  
Car body holster and draw bar spring pocket.  
Combined... H. M. Pfleger  
Car brake... P. W. Clark  
Car brake... H. B. Burke  
Car coupling... L. G. Daniels et al  
Car coupling... J. Farlow  
Car dumping... D. King  
Car fender... M. Wick  
Car fender... 2 pats. C. Hager et al  
Car for railways, &c. Removable...  
... P. J. Mitten  
Car. Freight... A. Becker  
Car. Passenger... H. F. Vogel  
Car. Railway... M. R. Rounds  
Car roof. Metallic... 2 pats. A. Campbell  
Car unloading apparatus... A. Buquet et al  
Carburized air burner for heating, cooking, &c...  
... O. M. Hudson  
Card support. Jacquard... A. J. Lagasse  
Carpet cleaner. Pneumatic... T. L. Chesnut  
Carriage. Child's... S. D. Butterworth, Jr.  
Carriage top stop... W. F. Smith  
Carving machine... F. H. Richards  
Casing spear... F. N. Donaldson  
Cask support... G. S. Rominger  
Casket... T. F. Combs  
Caster... J. M. Harper  
Caster... T. & A. E. Bourne  
Cattle guard... E. R. Kerr  
Cattle guard... J. M. Lee  
Cell cases. Machine for making...  
... W. B. Shened  
Cement cisterns. Extensible dome form for...  
... F. R. Keiser  
Chair fanning attachment. Rocking...  
... B. Heimerl  
Chart or scale. Color... A. H. Mansell  
Chis sorting apparatus... H. Powers  
Chisel. Hollow mortising... B. C. Rockwell  
Christmas tree attachment... A. R. Treichell  
Churn... J. W. Willson  
Churn dasher... H. A. Bierley  
Churn operating mechanism... J. L. Hoyle  
Churning machine... A. Overbay  
Clicker catcher... H. A. Gibbs  
Clock... A. D. Gary  
Clock. Intermittent alarm... W. E. Porter  
Clocks and similar instruments. Leveling  
device for... O. L. Ronney  
Clutch. Friction... H. L. Whitman  
Coffee apparatus. Jacket or hood for use in  
connection with the exhaust heads of hot  
water urns of... E. J. Monseuse  
Coffee. Refining and cleansing...  
... N. I. H. Weitzmann  
Coin operated mechanism... W. A. Hickey et al  
Coin register tapes. Means for keeping records  
of... W. G. Nagel  
Coke briquets. Manufacture of...  
... E. L. D. Zullerhock  
Collar pad. Horse... C. A. Reynolds  
Collar. Shirt... F. W. Parsons  
Compasses. Adjusting device in...  
... G. Schaeffer  
Composition of matter... H. Friedmann  
Composition in stick form. Receptacle or  
holder for... G. I. Orange  
Concrete mixing machine... W. H. Phillips  
Concrete steel construction... E. M. Scofield  
Concrete steel construction. Supporting de-  
vice for reinforcing bars of... E. M. Scofield  
Concrete wall construction. Mold for...  
... B. A. Mueller  
Concrete wall construction. Core for...  
... B. A. Mueller  
Condenser... W. Schwaenhausser  
Condiment holder... P. J. A. Schnoor  
Cooking utensil... E. C. Howland  
Cooler... 2 pats. D. M. Livingston  
Cook. Chicken... C. A. Haro  
Cup holder... A. Brown  
Core making machine... I. S. Nicholson  
Cork fabric and making the same... P. Sechlar  
Corset. Apparel... 2 pats. D. Kops  
Cotton gin... H. J. Tate  
Cotton gin. Roller... W. L. Crowson  
Conplings. Pivot pin support for... W. E. Coffin  
Cradle... S. L. Morse  
Crane. Portable traveling... G. R. Cullingworth  
Crate shipping... J. F. Moss  
Cream pasteurizer and cooler... H. N. Rivard

Cue holder... R. U. & W. Ruddell  
Cue rack... L. Sevirny  
Curtain fixture... I. B. Lamping  
Curtain frame... F. A. Justice  
Curtain roller cap... J. M. Berry  
Cuspidor attachment for bars... J. F. Heidt  
Cuspidor. Flushing... J. W. Cooper  
Cut out. Automatic safety... R. Richardson  
Cutting machine... W. A. Garrigus  
Dauber... G. B. Kragg  
Decorticating machine... W. J. Hollier  
Dental articulator... W. W. Crate  
Dental devices. Making... S. Towle  
Dentist... E. H. Allfree et al  
Desk and type writer stand. Roller top...  
... W. H. O'Keefe  
Detecting mechanism... G. R. Williams  
Detector bar clip... J. T. Hambay  
Die stock... T. R. Leighton  
Directory device... C. A. Johnson  
Dish scraper and cleaner... J. T. Fokett  
Distilling apparatus. Water... C. R. Dudley  
Door and shutter and certain connections  
thereof. Flexible... J. Baum  
Door closer... W. L. Giersdorf  
Door lock. Emergency exit... H. E. Clark  
Draft equalizer... W. F. Maas  
Drawer Desk... S. C. Hodell  
Dredging and excavating machine...  
... B. H. Coffey  
Driving gear. Roller tooth variable...  
... W. E. Golden  
Driving mechanism... D. L. Driver et al  
Duster. Feather... J. E. Senevel  
Eaves trough... J. F. Myer et al  
Ejector mechanism... E. H. Elder  
Electric meter. Coin freed... J. Allan  
Electric time signal... I. M. Powell  
Electrical machines. Brush holder for...  
... R. Stegried et al  
Electricity. Removing static... W. H. Chapman  
Elevator device. Safety... J. Taylor et al  
Elevator driving mechanism... V. W. Mason  
Elevator safety apparatus... I. G. Babio  
Elevator safety mechanism... G. Hall  
Embroidery machines. Reader or machine for  
perforating paper to be used with the jac-  
quards in automatic... F. Pittard  
Embroidery. Tulle or net... J. Diem-Bentler  
Engine speed regulating mechanism. Gas...  
... G. H. Ellis  
Eraser tip for lead pencils, penholders, pencil  
point protectors and the like... F. McIntire  
Excavating machine... A. J. Duceville  
Exhibition and amusement apparatus...  
... M. E. Pester  
Explosion engine... H. D. Dibble  
Explosive engine... E. J. Woolf  
Extension table. Folding... C. M. Langhorne  
Eyeglass mounting... C. F. Wall  
Eyeglasses... E. C. Bernheim  
Fabrics. Former for tubular... C. S. Shepard  
Fanning mill... S. S. Lofberg  
Faucet. Fluid measuring... G. K. Cooke  
Fence post... R. S. Hiltner  
Fence post... J. Ludwick  
Fence post... I. N. Miller  
Fertilizer... W. R. Chisolm  
Fertilizer material. Making... W. B. Chisolm  
Fibrous stalks. Treating... W. I. Hollier  
Filter... W. B. Klein  
Filter for feed water heaters... O. L. Stump  
Fire alarm boxes and for other things. Guard  
for door keys of... F. W. Cole  
Fire extinguisher. Automatic... H. W. Martin  
Fire. Means for protecting ships from...  
... H. W. McKinn  
Firearm... E. E. Neal  
Fireproof floor construction... A. Jordahl  
Fireproof safe... M. Mosler  
Fish line reel... H. H. Richardson  
Fluid fuel burner... E. G. Flager et al  
Fluid pressure motors. Governor for...  
... C. H. Johnson  
Fly trap... W. E. Thompson  
Frame structure... F. Molloy  
Fruit picking bag... J. Utterback  
Fruit receptacle... V. E. Stine  
Fruit weighing and packing machine...  
... C. S. Cox  
Fuel feeding device... E. Harcharich  
Furnace... I. F. Senter  
Furnace grate... E. Einfeldt  
Furnaces. Carbon holder for electric...  
... G. O. Seward  
Furnaces. Water cooled door frame for...  
... L. L. Knox  
Furniture. Insecticide holding attachment  
for... T. Alexander  
Game apparatus... J. F. Kidder  
Game board... E. E. Hille  
Game device... R. D. Martin  
Gardening tool... D. L. Kent  
Garment... J. Walter  
Garment class... H. H. Barnum  
Gas. Apparatus for the generation of ace-  
tylene... A. Rosenberg  
Gas burner... H. W. O'Dowd  
Gas generating furnace... C. A. Buzzell  
Gas heating apparatus... A. C. Carey  
Gas meters. Prepayment attachment for...  
... R. L. Fersenheim  
Gas producer... H. Gerdes  
Gas producer... R. Hilprecht  
Gas producer... E. Sandner  
Gas producer. Suction... E. Higgins  
Gas regulator... G. E. Crookshank  
Gasket removing tool... I. H. Opatenberg  
Gate... G. A. Mock et al  
Gate... J. W. Reynolds  
Gear wheel tooth. Detachable... F. L. Morse  
Gong. Electric... W. F. Word  
Governor. Engine... P. Mohrdoeck  
Grader. Road... A. L. Donogh  
Grain moving apparatus. Pneumatic...  
... I. C. Pieth et al  
Grain weigher... E. J. Vraalstad  
Grate. Chain... J. P. Barnes  
Grinding mill... M. F. Abbe  
Gum from vegetable matter. Obtaining...  
... E. Heber  
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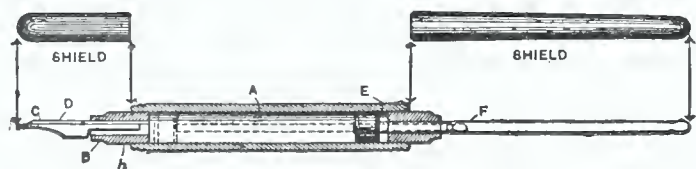
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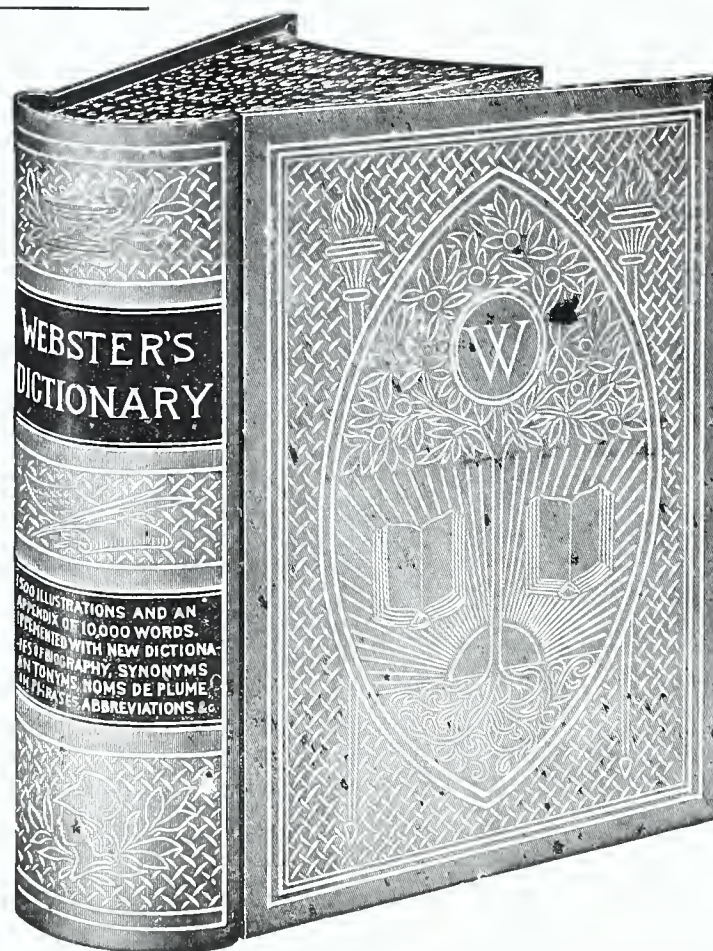
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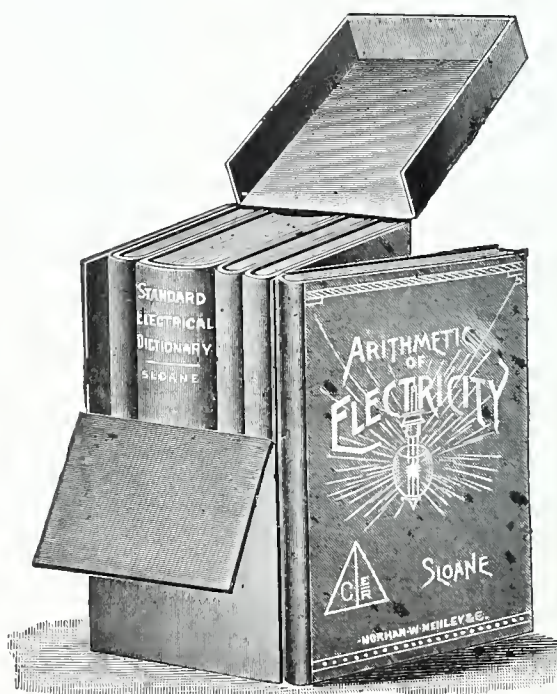
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## TRENCH DIGGING MACHINERY.

THE enormous growth in population of the United States has caused our land to be occupied to an extent that, a few decades ago, would have been considered impossible at the beginning of the twentieth century. It is true that there are still millions of acres of untilled ground in the Western States, but they are mostly inaccessible or undesirable. It will be a long time before we are cramped for elbow-room as are the peoples of Europe, but the movement of Americans towards Canada has shown that the most fertile and available parts of our country are already preempted. It is well known, however, that with the advance in transportation facilities, and with the completion of the great irrigation schemes that the Government now has under way, vast areas will be ready for the home seekers of the new generation. Not only are deserts to be made to blossom by means of artificial waterways, but swamp lands are to be drained and reclaimed for the use of man. A trench excavator that has recently been given the test of practical employment, bids fair to greatly facilitate both of these latter projects. The accompanying cut

on the Mississippi and elsewhere are marvels of efficiency, but they are also very expensive in first cost. Moreover, they are limited to certain kinds of soils. This new trench digger can be obtained at relatively little expense, and, as shown in detail below, its operation is also surprisingly cheap.

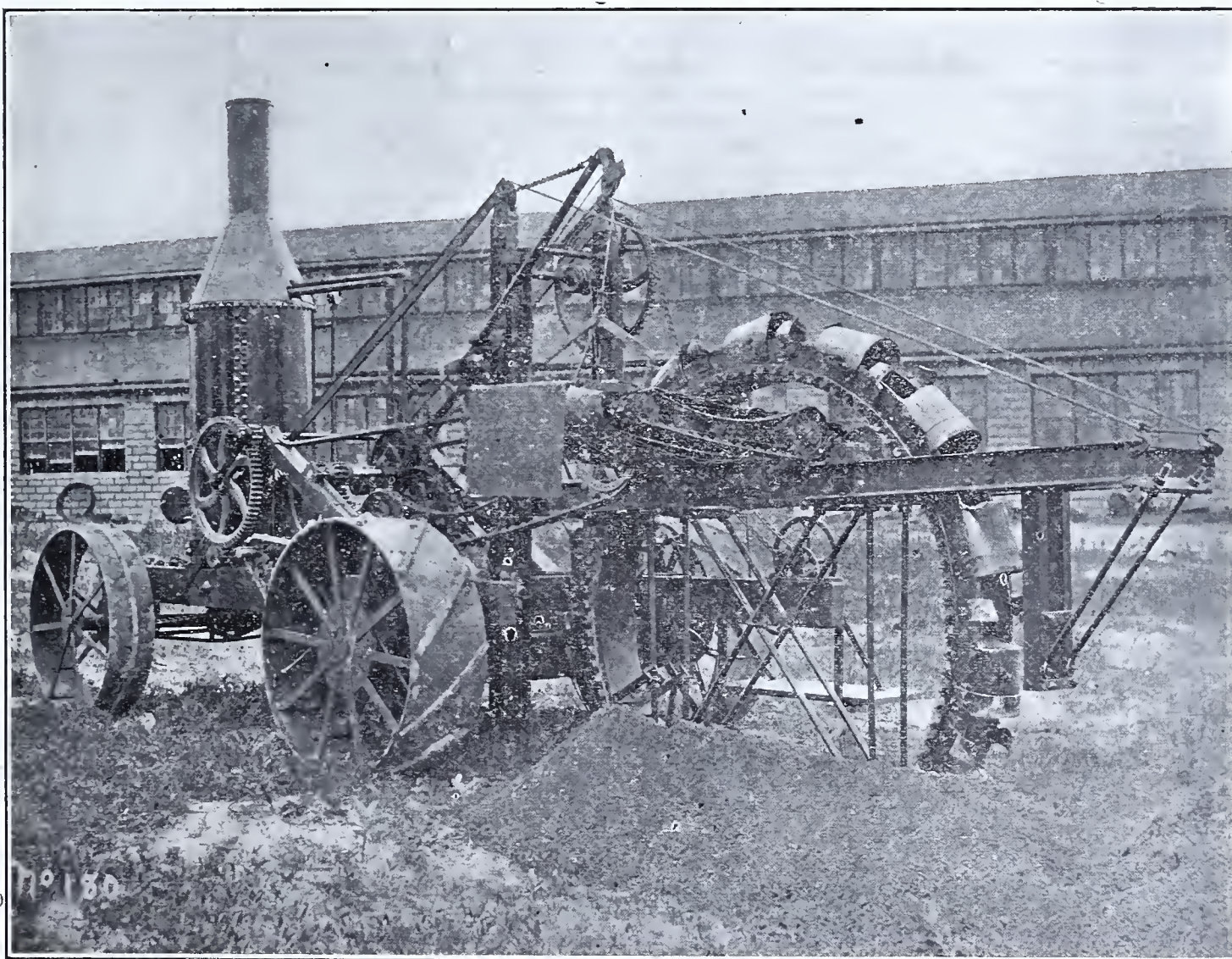
The machine consists essentially of a large wheel, to the periphery of which

the exact depth and grade desired. By sighting along range-poles stuck in the ground ahead of the machine, the operator can not only keep on line with his trench, but he can keep the bottom of the trench exactly to grade.

The machine is self-propelling, and moves steadily forward, leaving the completed trench behind. The operation of the apparatus is most inter-

the ditcher is geared to travel at a speed of 2 feet per minute. If kept up without interruption for ten hours, this would mean 1,200 linear feet of trench. When it is considered that in similar soil, a hand laborer can pick and shovel only 7 cubic yards out of a shallow trench in ten hours, it will be seen what a saving is effected by this machine. Besides, it is well known among contractors that few men can

be depended upon to cut a good bottom to their trenches. This is most exacting work, and it seldom receives the care that it demands. With the excavator, trenches can be cut whose bottoms need not vary one particle from a perfect grade line. There is no guess work, but it is certain that the trench will be cut exactly to the grade set for it. In addition—and this feature is often lost sight of—the soil is left in its natural state. The pores of the earth are not closed, as is the case when the ditch is cut with spades, with a mortise wheel, or with a machine employing a plow principle. There is no rubbing or pressing at the sides. The soil is cut with keen edged, circular cutters, and each cutter performs its exact por-



DIGGING A TRENCH BY MACHINERY.

unique device, which will also be found useful for digging sewers and water mains, draining roads, and for a hundred other purposes.

It has often been said that no method of earth excavation can compare in low cost with excavation by hydraulic dredges. The giants that do this work

are fastened the digging buckets. The wheel has no axle, but is supported by four pairs of rollers within its periphery. I-beams projecting from the rear of the trucks hold the wheel, and these I-beams can be quickly raised or lowered by the operator, so that the bottom of the wheel can cut to

esting to watch. It seems scarcely to be advancing at all, yet the steady stream of earth falling on the bank from the endless belt conveyer enables one to appreciate how fast it eats its way ahead. The illustration as shown above is digging a trench 26 inches wide by 7 feet deep in tough clay, and

portion of the work.

It takes three men to run this machine: an operator, a fireman, and a rigger or oiler. In addition to this, half the wages of a blacksmith must be added; for the teeth of the buckets and the side cutters must be sharpened once a week when working in tough



clay. The engines that run the machine are of 24 horse-power, and average 1500 pounds of coal per ten hours of steady work. With a liberal allowance for wages, etc., it is estimated that the cost of excavating is less than three and a half cents per cubic yard, much less than that of a steam shovel.

In trenching in marsh or swamp land, or when the machine is digging on the side of the street having a very sharp crown, provision is made for bolting planks to the inside of the traction wheels, and letting them extend out far enough to prevent the machine from sinking. This is done in order to keep the apparatus level and insure a trench with sides that are plumb. This is not so essential in dry, tough soils, but wherever the ground caves readily, even a slight overhang of either side of the trench causes caving.

For the data concerning this apparatus, we are indebted to the Van Buren, Heck and Marvin Co., of Findlay, Ohio, manufacturers of the traction ditcher.

#### Electrically Operated Church Organs.

There are perhaps few, if any, uses of electromagnetism in the arts that in ingenuity of design and reliability of operation approach its application to modern electropneumatically actuated organs. The motive power for the bellows or blowers that supply the air pressure in all up-to-date organs is furnished by electric motors, which lend themselves admirably to the rapidly varying minimum to maximum demands made upon them. The keys of the clavier, or keyboard, and the pedal keys are connected with electrical contacts which, in turn, are connected with wires leading to small electromagnets at the foot of the organ pipes. The armatures of the magnets act as valves which admit the necessary amount of air pressure. The magnets are about 2 inches long, and are wound with No. 22 B. & S. copper wire. For the key contacts some manufacturers use gold and platinum, while others employ silver. None of these wires oxidize, but silver is the cheapest. The contacts are self-cleaning or rubbing contacts, and are so constructed and protected mechanically that a uniform contact is made regardless of the violence with which the manual or pedal keys may be operated. The wires leading from the contacts to the organ proper are carried in a cable. It is obvious that the console may be any reasonable distance from the organ; also, that duplicate consoles may be placed in different places in a large auditorium. It would also be feasible to so arrange the circuits that one organist could play two or more organs in different places simultaneously from one console.—*Cassier's Magazine*.

THE INVENTIVE AGE contains sound advice to inventors and patentees. For lack of such advice many have lost money. Subscription, one dollar a year.

### THE LATEST ENGINE OF DESTRUCTION.

Uncle Sam is arming himself with a new torpedo which is undoubtedly the most formidable engine of destruction yet offered the navies of the world. Search the seven seas over or under, and nothing will be found quite so deceptive in appearance, and yet ruthless in reality, as this new marine Mephistopheles.

Several of the new torpedoes are now nearing completion, and the Secretary of the Navy has ordered 300 to be delivered as fast as made. As many as fifty will probably be sealed, set with timelock precision, and turned over to the Government during the present year. With their installation, it is believed the defensive, if not offensive, strength of the American Navy will be increased fully as much as if two 18,000-ton battleships were added to, say, the North Atlantic Squadron.

The formidable newcomer promises to change the complexion of at least defensive warfare, in that the American seaboard can be made virtually impregnable without reckoning upon the defensive power of battleships, armored cruisers, or any vessels other than surface and submarine destroyers.

Never has dumb metal so nearly approximated human intelligence as this deadly machine, weighing, in battle trim, about 1,500 pounds. As a sea dog, it has almost the sagacity of a perfectly trained pointer, coupled with extraordinary accuracy and speed. Thirty-six knots an hour is the time recorded of an official trial the other day, off Long Island, before a board of ordinary experts. Over a 1,200 yard range the trial tube was fired three times, and each time the destroyer struck the centre of a net target fifty yards wide. Nothing equal to such a performance has ever before been accomplished.

Civilians may not realize the full import of the achievement. It means that torpedo attacks in future may be delivered at long range, and not at close quarters, as in the Sea of Japan last summer. When the explosion took place off Long Island, the effect was as though a sudden earthquake had rent the sea for fully a mile in every direction. Vast swells billowed like tidal waves, and from the vortex sprang a pillar of water, fifty feet in diameter, to the height of 200 feet in the air. Certainly a battleship within striking range of so terrible and stealthy a force would be as brittle glass. Steel decks and bridges will cease to be isles of safety, and the sea will become a nightmare in time of war.

The Navy Department is going ahead with the expenditure of two million dollars on the first installment of the new torpedoes, the average cost of each being about \$6,000. Comparing the sum with the cost of even the largest projectiles used in the army and navy today brings us to the question, What is there in a torpedo which necessitates such outlay?

As a first item in the reckoning, some 400 chosen mechanics are now working overtime in the big foundry in Brooklyn to prepare the new destroyers. Every ounce of steel, brass, or bronze that enters into the 1,500 pounds has to be, to the tiniest fraction of an inch, according to specification. The threading of each style of valve or screw is different. Each piece of tubing must be tested and found capable under a required strain. The material entering into such an engine must be flawless.

The new torpedo is propelled by a pair of turbine screws, each eleven inches in diameter and containing eighty-four buckets, the screws being connected with a small turbine engine by two brass propellers. These screws are capable of performing 1200 revolutions a minute, or nearly 400 more revolutions than the older type. The motive power is compressed air, the air tank being situated just forward of the engine. The dynamite chamber is large enough to accommodate from 250 to 300 pounds of explosive, or enough to blow the mightiest battleship to atoms. The explosive is stored forward of the air flask, the sections being divided by a steel drum three-eighths of an inch in thickness.

What may be called the brain of the torpedo—the device which serves to steer the submarine straight for the enemy, and thereby to counteract any deflecting currents that might be met with en route—is known as the gyroscope. This is constructed on the ball-bearing principle, is rotary, and is placed in the stern of the torpedo, directly connected with the rudder. An entire department of the foundry is devoted solely to the construction of gyroscopes.

The efficiency of the destroyer is further increased by a combination wire cutter and trigger, which protrudes from the nose of the elongated, cigar-shaped body. This dual instrument has four blades, each about three inches wide and six inches long, which revolve rapidly as the submarine races through the water. It has been demonstrated to the satisfaction of naval experts that these blades can penetrate the stoutest net thrown about a ship. At the same time, contact with the net is not sufficient to drive back the trigger. This does not occur until the steel hull of the vessel itself is struck. Then the trigger rebounds against a dynamite cap, which in turn ignites an instantaneous fuse running into the dynamite chamber.

The torpedo has always been a riddle more or less baffling to players of the great game of war. Up to this time, the bark of the stealthy submarine has been worse than its bite, everything considered. Nevertheless, the torpedo has exercised a greater controlling influence upon naval construction and tactics than perhaps any other single weapon of marine warfare. There has hardly

been a time, since the first torpedo was launched, that its influence was not noticeable. But with the rapid development of the submarine fighting factors, the naval war of the future will be a thing almost too ominous for conception. Given a hundred destroyers in the navies of the greater maritime nations, and the international rules of warfare will have to be revamped.

Already, the most modern types of first class battleships, now on the ways, have been rendered antiquated by science between ordering and completion. Heretofore, the comparative torpidity—the slow speed—of torpedoes has made submarine tubes on warships impracticable, as the ship, manoeuvring at full or even three-quarters speed, has run the risk of running down the venomous missile before the latter has caught its stride. Now, these defects have been remedied, and by means of the gyroscope and turbine engine, extraordinary efficiency has been lent the destroyer. Action is being now taken by the U. S. Government to consider the installation of submarine tubes in the underbodies of the seven new battleships now being built and projected for the navy. If this is done, it will prove that the hour of the torpedo has at last come—that something more formidable than a sixteen inch gun has become an actual working reality; and finally that the tides of marine warfare are in the future to flow under, rather than on, the surface of the seas.

#### Calcium Steel.

It is not generally known that the so-called "calcium steel" is not any form of steel, or any other metal, but a ceramic product, made by baking in an oven a paste made of finely pulverized feldspar, sand, and lime in certain specified proportions.

These materials, being mixed with water and worked into a plastic paste resembling sculptor's clay, and then baked, produce a porcelain or earthenware of great hardness and durability, which resists corrosion by acids, or alteration by atmospheric influence, is a poor conductor of heat or electricity, has a specific gravity of 3.3, and is in color a yellowish white, which may be varied to any desired tint by the addition of metallic oxides.

By reason of its hardness and a certain toughness, which permits it to be bored, cut, planed, or polished—qualities which generally belong to metals rather than ceramics—this substance is popularly called, by reason of its ingredients and peculiarities, "calcium steel," although it is no sense a metal and has no relation whatever to steel.

So far as can be ascertained, it has not yet become an industrial product of any great importance, although its cheapness, ease of manufacture, toughness, and exceeding resistance to acids, moisture and other deteriorating influences are thought to specially adapt it for use as material for subterranean pipes and conduits, for water, gas, chemicals, etc.



### Novelties in Lamps.

Hardly a week passes that does not chronicle some improvement in illuminants. The efforts of those interested in electric lighting are directed to the construction of lamps of greater illumination efficiency. The present efficiency, it is surprising to note, is only 1 per cent, which means that 99 per cent of the energy used is converted into heat;—often a most undesirable property. As it is known that the light-giving efficiency increases with the rise of the temperature, it has been the object to use for threads in the lamps, metals which have a very high melting point, instead of carbon. The well known German company, Siemens and Halske, after years of experiment in this line, has begun to use tantalite for these threads.

Tantalite occurs in nature in various minerals. There are two groups of tantalite ores—tantalite and columbite. The tantalite ores, which are found in Australia and Scandinavia, contain tantalite of iron and tantalite of manganese. The columbite ores were first found in New England. From these ores tantalite is separated. It is a heavy mineral with a gray metallic luster, extremely resistant to acids and alkalis. In its pure form, it has the hardness of soft steel, but possesses a much greater tensile strength. It can be worked into thin sheets and extremely fine wires, and its melting point is extremely high. Through repeated annealing, it acquires such hardness that tantalite sheets withstand even a diamond borer.

The technical use of large quantities of tantalite is at present impracticable, as 1 pound of this element costs nearly \$5,000. The importance of its physical and chemical properties to industry is shown by the fact that Siemens and Halske have taken out more than two hundred patents in Germany and other countries for its various processes of manufacture and use. The incandescent lamp with a tantalite, instead of a carbon filament, has various advantages over other means of lighting. It requires only one half the current of ordinary incandescent lamps of equal lighting power; the light is also much whiter.

One of the principal drawbacks in the electric light has been the impossibility of turning it up or down, as occasion required, after the manner of gas, so that a "peep" may be left when the full glow is not required. This difficulty has been overcome by the introduction of the "Turn down Lamp," which is coming into general use in this country. The lamp contains two filaments, one bright and the other dim; and these may be brought into use as required, either by pulling a string or by turning the bulb to right or left, as a bright or a dim light is required. The thing is simplicity itself; and it is claimed that there is a saving of 80 per cent of current when only the small filament is used, and that it has a combined

life of four times that of an ordinary lamp. A practical "turn-down" lamp will be of advantage to consumers generally, and will enable them to rid themselves of the reproach that a house lighted electrically is usually in darkness. Such a lamp, it is easily conceivable, will be of great value to theatres and places of amusement where the lights have to be turned down two or three times in the course of an evening's performance. What is called a dimmer is in use in some such places, and this contrivance avoids not merely the risk of interruption to the performance, but also of fire. It is a curious circumstance that of the entire equipment of the ill-fated Iroquois Theatre at Chicago, the only parts that remained uninjured were the dimmers.

But illumination is advancing in other lines as well as in that of electricity. The Hewitt mercury lamp, described in the AGE some months ago, has been improved by the substitution of quartz for ordinary glass. Quartz glass, although tedious of manufacture, has the compensating advantage of immunity from damage by changes of temperature. In white heat it can be immersed in cold water without showing the least change of form; for this reason it is especially adapted for apparatus used for physical and chemical processes.

A new gas called lusol is being tried by the Paris authorities with a view to its use in the streets. It is said to be cheaper than electricity, gas or oil. Lusol is a product of the gases of coke, is rich in carbon, and is said to possess superior illuminating power.

Yet another novelty is a lamp with a container filled with indestructible, porous, absorptive material, which is charged with the ordinary petrol made familiar by automobiles. The spirit is poured into the container and all surplus liquid drained back again into the can. The container, thus charged, is perfectly safe, for there is no loose liquid; and even if a match be deliberately applied to it, it will burn quietly and in such a way that it can be instantly extinguished. The lamp is in appearance much like an ordinary oil lamp; but in place of the dangerous oil reservoir there is a receptacle in which the charged container is placed. Above it is an ordinary incandescent gas mantle. A lighted match held for a moment inside the chimney at the lower end creates a draft; air charged with petrol vapor is sucked up from the container below and ignites at the burner exactly as if it were ordinary gas, and the flame is regulated by means of a gas tap. If the lamp be turned over, it simply goes out, because the draft is destroyed, and nothing further happens. The only element of danger lies in the charging of the container, and this has been obviated by the use of a little connecting-piece, whereby the container can be screwed direct to the collar of the ordinary petrol can. Can and container are then inverted for a moment or two and turned back into their original position. By this means there is no fear whatever of spilling the dangerous liquid, and there is no time for vapor to escape and find its way to a source of ignition.

### The Coming Exhaustion of the Metals.

The time can be foreseen when the world's supply of metals, so far as at present known, will be exhausted, and the problem will be how to replace them. If lead, zinc, tin, mercury, gold, silver and nickel were to disappear from the earth, it would cause great inconvenience; but mankind would, in the course of half a century, adjust itself to the loss without serious hindrance to its activities, because iron and copper would be left. If gold should disappear, we should for a time have trouble in our traffic, but another standard of value could be established. On the other hand, it would be very difficult to replace lead, and it is likely to disappear if war should continue for a century to come at the rate of the past century.

Iron, according to a leading metallurgist of the country, seems destined to run low. It is not to be supposed, he declares, that the iron age will suddenly pass away; its passage will doubtless be gradual. The deposits other than those of China, which can produce iron at the present low labor cost, will almost certainly be exhausted within one hundred years. Those of China may last for a similar term after they become the centre of a large industry. Then the cost of production will gradually increase as the lower grade ores and those remote from coal come into use. In the end we shall have to resort to concentrating processes, by which the iron ore is separated from the rock in which it is disseminated as grains. This upward grade in cost means a downward grade in the utility of the metal in the service of man. Finally, it may be some centuries from now, but surely we shall be forced to an economy in the use of the metal such as was exercised two hundred years ago, when, save for what went down at sea or rusted back to earth, none of it was lost to the arts. In this stage, when it again becomes a precious metal, iron may continue to be the helper of man for an indefinite period, but its power for help will be greatly diminished.

The outlook in the case of copper, the same authority thinks, is similar to that with iron. The sources of supply are much rarer, and the total amount of the metal in the crust of the earth is probably not the thousandth part of that of iron. But we can look upon the approaching exhaustion of the sources of copper with less apprehension than in the case of iron, for the reason that useful as the metal is in manifold ways, it is not indispensable or even very necessary in our arts except in the transmission of electric

power, and even then substitution is possible. Save for this use, the economic world could soon adjust itself to the loss of this once indispensable metal. However, he concludes that it is not probable that the mechanical foundations of our economic civilization will be endangered, because aluminium is likely in time to take the dominant place now held by iron, and in its qualities aluminium is admirably adapted to serve the greater part of the needs now served by iron and copper.

As for tin, the evidence is to the effect that it cannot long be supplied in quantities or at a price which will render it serviceable in the arts. It is not likely that it will hold its place through this century. Zinc is possibly more important than tin; it serves a variety of uses as sheet metal as well as a coating of iron to avoid rusting. It is also, in an oxidized form, of decided value as a paint, but in all these services to the arts it is replaceable by other metals. The distribution of its ores is wide and their abundance considerable. They are found to a great extent in veins which hold their contents of the metal in the extreme depth of mining work. The general conditions point to the conclusion that this substance is one of the last of the underground values to be exhausted. Yet, as it is mainly to be won as a by-product of silver, lead, etc., the duration of the supply is probably dependent upon the production of these metals.

Among the minor metals of special value, irreplaceable so far as we can now see, there are several which give the forecaster concern. Mercury is imperatively needed in mirrors and in a wide range of scientific instruments such as thermometers and barometers, as well as in the processes of amalgamation by which the greater part of the gold supply is won from ores. This metal is scantily and peculiarly distributed. There are less than half a dozen places in the world where it is known to occur in sufficient quantities to repay the miner, and none of these deposits give promise of long endurance. It is, indeed, likely that the first important deprivation to be encountered in the approaching exhaustion of metallic stores will be of this substance. A like apprehension is due in the case of platinum. This metal is peculiarly necessary to the chemist, as it alone has the needed resistance at once to heat acids, such as is required in a large part of the laboratory experiments, as well as in some processes of manufacturing. Thorium, which serves in making the mantles of incandescent lamps, as well as sundry other substances needed in particular arts, is about as unpromising for the future as those above mentioned, but is likely that they may be replaced, or at the worst, the deprivation will not be serious if they are lost to the arts.

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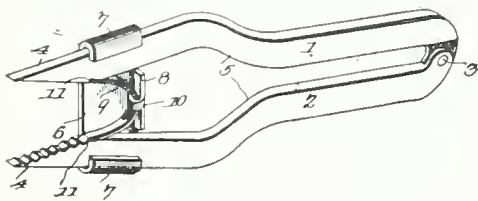


## CLEVER NEW PATENTS.

Wrench.—A New Twine Holder.—Commode.—Wood Working Machine.—Combined Adze and Slicker.

### Wrench.

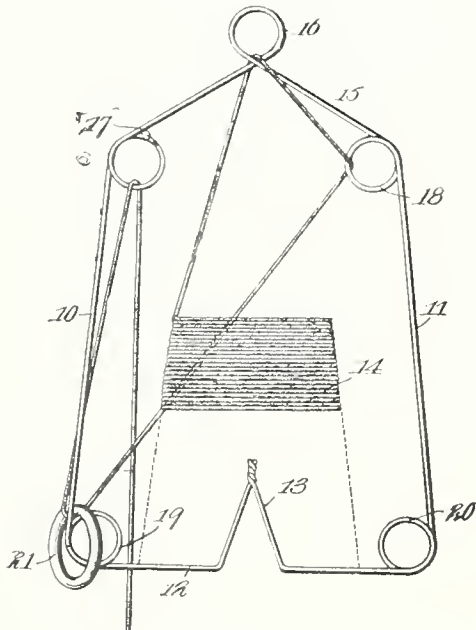
In 1901, Mr. Even E. Kettelsen, of Albany, Wis. was granted a patent on a peculiar type of wrench, and since then, he has secured patent protection on improvements in the original form of structure. The new wrench consists of a pair of pivotally connected arms 1 and 2 having converging portions that terminate in jaws 4. A yoke-shaped slide 6 embraces the converging portions, and a bowed spring 9, carried by the slide, has its free ends frictionally engaging the inner faces of the wrench members, said inner faces being provided with notches at their outer ends for engagement with the ends of the spring to limit the movement of the slide.



The slide has a flange 8 located between the wrench members to limit the inward adjustment of such slide, a portion of the flange being bent over the spring and constituting means for holding the same in place. The purpose of the spring is to insure an effective frictional engagement between the ends of the yoke-shaped slide and the wrench members, so as to prevent accidental slipping of the yoke, while at the same time permitting of manual adjustment thereof.

### A New Twine Holder.

While many twine holders have been patented, for simplicity of construction, it will be hard to match that devised by Mr. John C. Jacoby, of Ashland, Ohio, who has assigned the patent obtained thereon to Martha L. Jacoby and Charles W. McCool, of the same place.



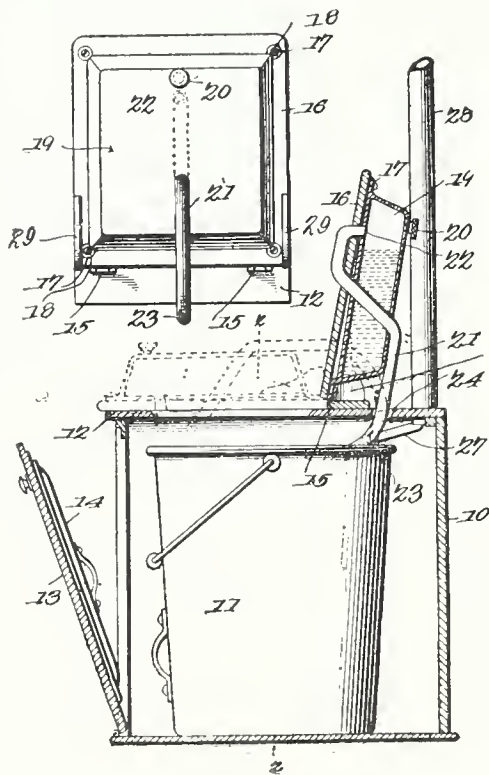
The frame of the holder is formed from a single piece of wire, comprising upright sides, a horizontal lower member having an upwardly extending central cord support 13, and an

upper member bent into a central eye 16 by means of which it may be suspended. Resilient guide loops are formed at the corners of the frame, and on one of the side rods is slidably mounted a ring weight 21. The cord is passed through certain of the eyes and engages the right weight, the latter constituting means for supporting the free end of the cord out of the way when not in use.

The device is intended more particularly for use in retail stores where goods are to be wrapped. It will be noted that by the arrangement shown, an extremely simple and inexpensive structure is produced, which may be quickly and readily installed, which will effectually support the cone of twine in convenient position for use, and automatically elevate the severed end when not in use. The resilient portions 17 and 18, serve an important purpose as tension guides for the twine and also as springs to maintain the sides of the support 13 pressed outwardly to hold the cone 14 with sufficient firmness to prevent accidental displacement.

### Commode.

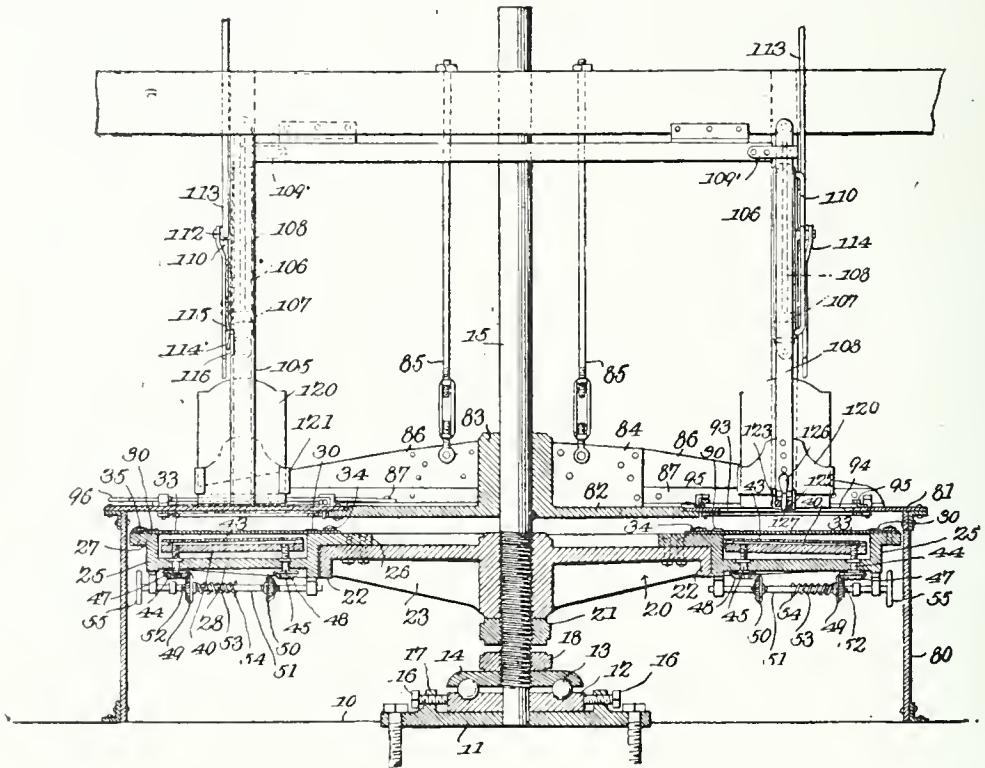
A portable commode of simple construction is the subject matter of a patent granted to Mr. Milton B. Smythe, of Holton, Kansas. A casing 10 is employed that receives a detachable receptacle 11 of any suitable character, and the seat is provided



with a swinging cover 16, on the rear or top of which is mounted a reservoir 19 for a disinfecting compound or solution. A discharge pipe 21 leads from the upper portion of the reservoir, being extended through the cover and projecting to a point above the receptacle within the casing. By this means, when the cover is closed, the pipe will be partially charged with material from the reservoir, and then when the cover is raised, this charge will flow into the receptacle. The action is repeated each time the cover is operated.

### Wood Working Machine.

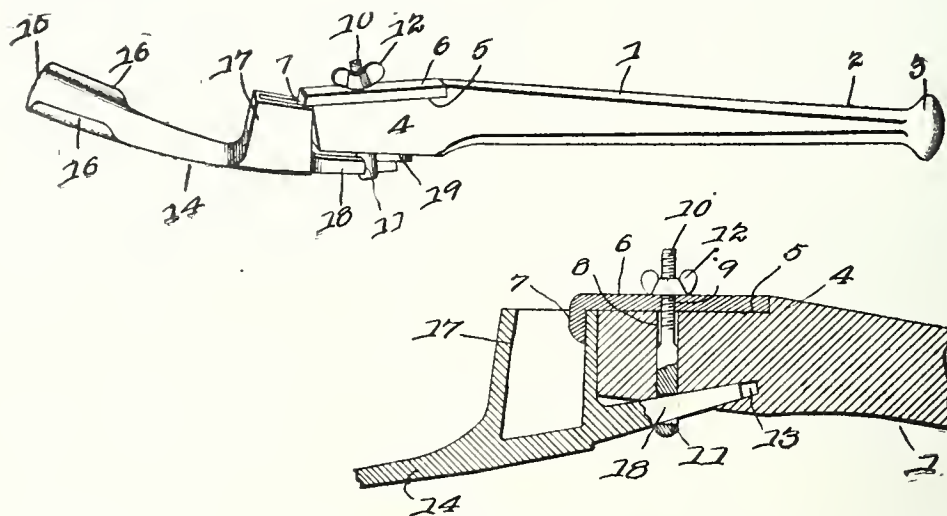
A machine for manufacturing shingles, fruit box blanks, and the like with great rapidity, has been devised and patented by Mr. D. F. Baker, of Dundee, Oreg. A stationary frame 82 is employed, on which are mounted a series of novel and adjustable block holders 120. Beneath the frame is journaled a rotary cutter member 20, provided with a plurality of cutting knives 33. Arranged beneath these cutting knives are guides or block supports 40. In using the machine the blocks of wood are placed in the holders 120, and the supports



40 are properly adjusted with respect to the knives 33. Thus, if shingles are to be cut, the supports are disposed in angular relation to the knives, but if other blanks are to be produced, then they are placed parallel. It will thus be seen that when the cutter member 20 is rotated, the blocks resting thereon will drop into engagement with the supports 40, and the cutters 33 will cut the blanks from the undersides of the blocks. The result is that blanks, shingles or the like can be produced in large quantities, and at small cost, for the blocks can be placed in position without the necessity of stopping the machine, so that as fast as one has been cut up, another may be introduced. The rapidity of action will be apparent when it is considered that if six block holders are employed, and four knives, 24 articles will be cut upon each revolution of the knife holder.

### Combined Adze and Slicker.

Heretofore it has been the custom to employ a tool, known as a "slicker" for smoothing or dressing the work after the comparatively rough action of the adz. Mr. Michael Enright, of Norfolk, Va., has patented a tool, which may be employed, either as an ordinary adz or as a "slicker," and has assigned a one-half interest to Mr. George Silk, of the same place. The tool handle may be of substantially any shape, and is provided at one end with a longitudinally disposed plate 6, having a hook 7. A transverse slot 8 is formed in its end, and an inclined socket 13 extends into the handle at one side thereof. The adz blade or head is of the ordinary construction having the cutting portion 15, the socket or eye 17, and the balancing projection 18.



When used as an adz, the head is disposed transversely of the handle, one end of such handle being received in the socket or eye 17. When used as a slicker, the head is arranged longitudinally of the handle, as shown in the accompanying views. The hook 7 engages in the socket or eye, the balancing projection extends into the socket 13, and is engaged by a clamping eye bolt 10, that is passed through the transverse socket 8, and engages the plate 6 to hold the same in place.



## LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

JOHNSON et al. v. FOOS MFG. CO.

(Circuit Court of Appeals, Sixth Circuit.  
141 F. R. p. 73.)

### 1. PATENTS—SUIT FOR INFRINGEMENT— EQUITY JURISDICTION.

The fact that a defendant, sued for infringement of a patent by making and selling the patented machine, has made and sold but one such machine, and that pending the suit the purchaser was licensed by complainant, does not deprive a court of equity of jurisdiction to award an injunction, unless it further appears clearly that there is no reason to apprehend the making by defendant of other infringing machines.

### 2. SAME—INFRINGEMENT—SALE OF PARTS OF COMBINATION.

Where all the parts of a patented combination were old, and the only invention is in their new arrangement, one who makes and sells the old parts is not chargeable with infringement, provided it was done with no purpose to contribute to plans of another intending an infringement by combining such parts in accordance with the patent.

### 3. SAME—SUIT FOR INFRINGEMENT—DIS- CLAIMER OF INVENTION TO INFRINGE IN FUTURE.

The assertion in the answer of a defendant sued for infringement, of a right to make the devices complained of as an infringement, in the absence of a very express denial of a purpose to exercise the right claimed, justifies the presumption that further infringement is to be apprehended, if that device shall prove to be an infringement, and the coupling with such assertion of a general averment that defendant does not intend to employ the patented device or to interfere with the rights of complainant cannot be construed as a disclaimer of an intention to continue to make the infringing device.

### 4. SAME—VALIDITY AND INFRINGEMENT— PROCESS AND MACHINE FOR DELINTING COTTON SEED AND HULLS.

The Johnson patent, No. 506,268, for a process and apparatus for separating cotton seed and hulls from the fiber adhering there-to after ginning, was not anticipated, and discloses invention as to the process claim; but the mechanical claim, as well as patent No. 654,550, to the same patentee for improvement thereon, is void for lack of patentable invention, being for an aggregation of old parts, each of which performs its old function. The process claim of patent No. 506,268 also held infringed by the defendant, which built and sold apparatus adapted and intended to be employed to practice such process, and thereby contributed to infringement by the user.

On Rehearing.

### 5. SAME—COSTS.

Rev. St. §§ 973, 4922 [U. S. Comp. St. 1901, pp. 703, 3396], which provide that a plaintiff or complainant recovering judgment or decree for infringement of part of a patent shall not recover costs, where the claims of the patent were too broad, and no disclaimer was entered before suit, do not apply to the costs in the appellate court, where the decree below dismissing the suit is found erroneous, and the complainant was compelled to appeal to obtain the relief to which he was entitled.

PENNSYLVANIA STEEL CO. v. PETTIBONE, MULLIKEN & CO.

(Circuit Court of Appeals, Third Circuit. 141 F. R. p. 95.)

### 1. PATENTS—INFRINGEMENT—RAILROAD SWITCH STANDS.

The Strom patent, No. 498,196, for an improvement in railroad switch stands of the Mansfield type, which consists in placing the crank which moves the connecting rod on the target shaft below the segment gear, but within the case, for the purpose of breaking the force of the wheel thrust of cars against the gearing when the switch is operated automatically, is not infringed by a switch stand in which the crank is placed on the end of the target shaft extended below the casing, for the sole purpose of allowing the gearing to be completely inclosed by the case, and thus protected from clogging by sand or snow.

CENTRAL FOUNDRY CO. v. COUGHLIN.  
(Circuit Court of Appeals, Fifth Circuit.  
141 F. R. p. 91.)

### 1. PATENTS—INFRINGEMENT—IMPROVERS.

Where a patent is for an improvement on

a known machine by a mere change of form or a new combination of parts, the patentee cannot invoke the doctrine of equivalents to establish infringement by another, who has also improved the original machine by the use of a different form or combination performing the same functions.

### 2. SAME—FOUNDRY LADLE.

The Coughlin patent, No. 553,055, for a foundry ladle divided into compartments, each compartment having a detachable pouring spout attached to the body of the ladle by means of flanges, covers a new combination of parts, the most of which are old, its principal features being the partitions and removable spouts; and it is not infringed by a ladle which has neither the partitions nor spouts described in the patent.

BULLOCK ELECTRIC MFG. CO. et al. v.  
CROCKER-WHEELER CO.

(Circuit Court, D. New Jersey. 141 F. R.  
p. 101.)

### 1. PATENTS—LICENSE—CONSTRUCTION OF CONTRACT.

A license contract, giving the defendant the right to use certain inventions made by complainant, construed, and held to expressly except therefrom the invention covered by the patent in suit.

### 2. SAME—ANTICIPATION—EVIDENCE OF DATE OF INVENTION.

Declarations of a patentee relating to his invention, accompanied by descriptions thereof, and made before his application for a patent was filed, are competent evidence to carry the date of his invention back to the time when they were made.

### 3. SAME—VALIDITY—EFFECT OF CANCELLA- TION OF CLAIM.

The cancellation of a claim in an application for a patent, while it is pending in the Patent Office, does not affect the validity of a retained claim which is substantially the same, although, if susceptible of two constructions, it will not be so construed as to cover the canceled claim.

### 4. SAME—INFRINGEMENT—ELECTRICAL DIS- TRIBUTION.

The Leonard patent, No. 478,344, for a system of electrical distribution, discloses invention, and was not anticipated, by the Smith patent, No. 471,063, which, although prior in date and time of application, is based on an invention made at a later date than that of Leonard. Also held infringed as to claims 1, 2, 4, 8, and 9.

HOE et al. v. MIEHLE PRINTING PRESS  
& MFG. CO.

(Circuit Court, S. D. New York. 141 F. R.  
p. 112.)

### 1. PATENTS—INFRINGEMENT—RIGHT OF AC- TION.

The fact that no machine has ever been made and shown to work successfully under a patent does not prevent the owner of the patent, if it is valid, from restraining infringement of it.

### 2. SAME—PRINTING PRESSES.

The Read patent, No. 688,690, for improvements in bed motions for cylinder printing machines, was not anticipated and discloses invention, but is of narrow scope and is not entitled to a broad construction of its claims to extend them beyond the actual invention described, which consists in the main of the use of a two-part bed driving wheel; the rim being mounted and movable directly upon the body of the wheel. As so limited, held not infringed.

BRAGG MFG. CO. v. MAYOR, ETC., OF  
CITY OF NEW YORK et al.

(Circuit Court, S. D. New York. 141 F. R.  
p. 118.)

### 1. WITNESSES—REFRESHING MEMORY— NEWSPAPER ARTICLES.

Upon the issue of prior invention, witnesses testifying as to the use of such invention by others may properly refresh their memories as to the time of such use by reference to contemporaneous newspaper articles describing the invention which they read at the time.

### 2. COURTS—COMITY—PRIOR ADJUDICATION VALIDITY OF PATENT.

Prior decisions sustaining a patent are to be given effect under the rule of comity only as to matters which were before the court. With respect to defenses or evidence not before the court, the action of the court in a subsequent case is purely original.

### 3. PATENTS—PRIOR INVENTION—GONG AT- TACHMENT FOR ENGINE HOUSES.

The Bragg reissued patent, No. 6,831 (original No. 165,438), for a gong attachment for engine houses, held void for prior use of the invention by others.

GENERAL ELECTRIC CO. v. GARRETT  
COAL CO.

(Circuit Court, W. D. Pennsylvania. 141  
F. R. p. 124.)

### PATENTS—INFRINGEMENT—TROLLEY STAND.

The Bentley patent, No. 488,179 for a trolley stand for electric cars, construed, and held not infringed by a device which did not contain a spring plunger sliding in the drum to support the trolley pole, which is made an essential element of the combination of each claim, nor any mechanical equivalent thereof.

MURRAY CO. v. CONTINENTAL GIN CO.

(Circuit Court, D. Delaware. 141 F. R.  
p. 126.)

### PATENTS—FEEDING SEED-COTTON TO GIN— INFRINGEMENT.

The apparatus covered by claims, Nos. 1, 2, 9, and 12 of patent No. 472,607, dated April 12, 1892, granted to Stephen D. Murray, assignor to William Burr and John H. Deems for "Improvements in Apparatus for Elevating, Distributing, and Feeding Seed-cotton to Gins," and of claim No. 8 of patent No. 644,532, dated February 27, 1900, granted to Stephen D. Murray for "Improvements in Cotton-elevators and Gin-feeders," if not void for want of invention, in view of the prior art, must receive such a narrow and limited construction as to negative infringement.

THOMSON-HOUSTON ELECTRIC CO. v.  
INTERNATIONAL TROLLEY CON-  
TROLLER CO.

(Circuit Court, W. D. New York. 141 F. R.  
p. 128.)

### 1. PATENTS—SUIT FOR INFRINGEMENT— PRELIMINARY INJUNCTION.

Where the validity of a reissue patent has been adjudged by the Circuit Court of Appeals, a defense of laches in applying for the reissue, set up by a defendant in a subsequent suit for its infringement, is not sufficient ground for refusing a preliminary injunction, where infringement is not denied.

### 2. SAME—TRAVELING CONTACT FOR ELEC- TRIC RAILWAYS.

A preliminary injunction granted, restraining infringement of the Van Depoele reissued patent, No. 11,872 (original No. 495,443), for a traveling contact for electric railways on a prior decision sustaining its validity.

STAR CO. v. COLVER PUB. HOUSE.  
(Circuit Court, S. D. New York. 141 F. R.  
p. 129.)

### COURTS—UNITED STATES COURTS—PRO- CEDURE—PRELIMINARY INJUNCTION.

It is the rule in the Federal courts that a preliminary injunction will not be granted unless the papers present a clear case.

MOXIE NERVE FOOD CO. OF NEW  
ENGLAND v. HOLLAND.

(Circuit Court, D. Rhode Island. 141 F. R.  
p. 202.)

### TRADE-MARKS AND TRADE-NAMES—SUIT FOR INFRINGEMENT—PRELIMINARY IN- JUNCTION.

Statements made on the labels and wrappers of a preparation as to its medicinal value and the cures it has effected are so largely matters of opinion rather than statements of fact that, although apparently extravagant, they will not justify a court of equity in refusing a preliminary injunction against an imitator, who is clearly infringing the proprietary rights of the maker.

BATES MFG. CO. v. BATES MACH. CO.  
(Circuit Court, D. New Jersey. 141 F. R. p.  
213.)

### 1. TRADE-MARKS—UNFAIR COMPETITION— USE OF NAME.

In the absence of contract, fraud, or facts raising an estoppel, the fact that a person assists in forming a corporation in the name of which his own name is used, does not preclude the use of his name as a part of that of another corporation in which he subsequently becomes interested, although it is organized to engage in competing business.

### 2. SAME—IMITATION OF PACKAGES—INJUN- TION.

A manufacturer will be enjoined from so dressing his goods for the market that they are likely to be mistaken by purchasers for the goods of a competitor earlier in the business.

CHARMBURY v. WALDEN.

(Circuit Court, D. New Jersey. 141 F. R.  
p. 373.)

### 1. PATENTS—ANTICIPATION—EVIDENCE.

Alleged anticipating patents introduced by a defendant in a suit for infringement are entitled to little consideration, unless there is expert or other evidence to show their relation to the patent in suit.

### 2. SAME—INFRINGEMENT—VAMP STAY FOR SHOES.

The Charmbury patent, patent, No. 717,348, for a vamp stay for shoes, considered, and held not anticipated, valid, and infringed.

PALMER v. WILCOX MFG. CO.

(Circuit Court, S. D. New York. 141 F. R.  
p. 375.)

### 1. PATENTS—SUIT FOR INFRINGEMENT— PRELIMINARY INJUNCTION.

The fact alone that a patent is unadjudicated will not defeat the right to a preliminary injunction against its infringement; but unless it also appears from common knowledge, or from the prior art shown, that there is reasonable ground for doubt as to its validity, the presumption arising from its issuance by the Patent Office is sufficient to warrant injunctive relief against an infringer.

### 2. SAME—BOLT ANCHOR.

The Newton patent, No. 725,278, for a bolt anchor, held valid and infringed on a motion for a preliminary injunction.

BAGLIN et al. v. CUSENIER CO.

(Circuit Court of Appeals, Second Circuit.  
141 F. R. p. 497.)

### TRADE-MARKS—INJUNCTION AGAINST IN- FRINGEMENT—CHARTREUSE.

For many years the order of Carthusian monks, of the convent La Grande Chartreuse, in France, have made and sold a liqueur, under the name "Chartreuse," claimed to have been made by a secret process. Such liqueur has long been sold and has become well known under such name in the United States, where the name is registered as a trade-mark. The order having been expelled from France by the government, a receiver was appointed by a provincial court, who, under authority of the court, now carries on the business, putting up the product of his manufacture in the dress and under the labels and name formerly used by the monks, in which form it is sold in this country by defendant as agent. Meantime the monks re-established their business in Spain, where they make and sell a liqueur under a new trade-mark and labels, which set forth the facts with respect to the removal. No final adjudication of the rights of the parties has been had in France. Held, that a preliminary injunction restraining defendant from using in this country the bottles, labels, name, and trademark formerly used by the monks, based on affidavits largely made on information and belief, and which do not determine the question whether the product is the same originally sold under such trade-mark, was too broad in its terms, and should at least be modified by allowing sales by defendant, provided an additional label was attached to each package setting forth the facts with respect to the manufacture.

Townsend, Circuit Judge, dissenting, on the ground that the sale by defendant of the receiver's product under the name, labels, and trade-mark of the monks, without any distinguishing mark, was a fraud on the public, which should be enjoined, regardless of the quality of the article or the action of the French courts.

AMERICAN BRAKE BEAM CO. v.  
PUNGS.

(Circuit Court of Appeals, Seventh Circuit.  
141 F. R. p. 923.)

### CONTRACTS—LEGALITY—RESTRAINT OF TRADE.

A contract recited that plaintiff, who was the patentee of an invention relating to brake beams, for the consideration of \$10,000 to be paid him, had assigned to defendant, which was a corporation engaged in the manufacture of brake-beams, a certain patent and a pending application for a second, and provided that plaintiff during the life of the patent should not become connected with any company manufacturing or selling brake-beams in the United States, either as officer, employee or shareholder but reserved to him the right to terminate such part of the contract at any time by refunding the consideration paid him by defendant. Held, that such agreement to remain out of the brake-beam business did not render the contract unlawful as one in restraint of trade and competition or creating a monopoly, and that plaintiff could maintain an action thereon to recover the stipulated consideration.



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## Artificial Foods.

Science is busy in providing artificial forms of nourishment. Foods are condensed, preserved, and otherwise prepared to suit human needs and varying conditions of consumption. In view of the recent revelations as to the handling of meats in the Chicago packing houses, it is reassuring to be told that this article of diet can be entirely dispensed with. Nor are the "health foods" to be our only reliance in this emergency. Scientists assert that the principal nourishment required to maintain the human body is albumen. This, they say, is the source of all muscular strength, and it has been their endeavor for years to gain more knowledge of this important ingredient of our food. It was recognized that were it possible to make artificial albumen, a revolution in our present system of nutrition would be effected. Up to now such efforts have been futile, but a German professor has succeeded at length in effecting the first analysis of natural albumen. He has established the composition of the various ingredients, and has produced some of them by artificial means. The resulting substance is said to possess most of the properties characteristic of natural albumen. This interesting discovery may in time render us independent of the meat trust.

Another revolution in food, which promises to exercise as notable an effect on our vegetable diet as cold storage has on the world's supply of meat, consists in the condensation of plant foods. The process leaves the structure of the vegetable intact, and in no way alters the vital reproductive power; but the weight and size are reduced to about one tenth of the original. The prepared plants, it is said, in their glass cases, resemble the dwarf trees of the Japanese. Most of them retain their natural color; the spinach remains green, the carrot red and yellow, the cauliflower creamy white. The potatoes are in hard curly pieces, half an inch long. The lettuce is in tiny crisp leaves; the cabbage heads are not much larger

than tin tacks. These pygmy productions, when cooked, swell to their ordinary size. The aroma is unaltered by the treatment, and the taste is said to be as fresh as though they had just come from the garden, although they may have been preserved for months. Supplies have already been sent to various parts of the earth, and arrangements are being made to supply the British army and navy. Our soldiers in the Philippines will be glad to have home-grown vegetables. For long voyages, and especially for arctic explorations, they will provide a welcome variety in the menu. With this new meat substitute and the vegetables in miniature, scurvy, that scourge of the frigid zone, will become a thing of the past.

## A Revolution in Science.

Few people appreciate the fact that we are now passing through a revolution in physical science. A revolution in theology, such as that involved in the acceptance of the theory of evolution, or of higher criticism; or a revolution in political science, such as the substitution of a protective tariff system for free trade, arouses great excitement, and is accomplished only with much popular discussion. On questions like these, everyone takes sides, and has pronounced views to express; but the intellectual revolution which has been caused by the discovery of radio-activity has been received with curiosity, and nothing more, on the part of the general public.

It is safe to say that the ten years since 1896, which have witnessed the finding of the Becquerel rays, the X-rays, the development of their properties, the discovery of radium itself, and the proof of the natural radio-activity of matter, will be considered by our descendants as one of the most important periods in the history of the world. The fundamental conceptions of the universe, which had prevailed since the dawn of reason, have within this time been utterly demolished. We are not yet able to adjust our minds to the new conditions. It must be understood, however, that a revolution in science does not mean that scientists have found that their teaching is false. Such a revolution results, on the contrary, not from the overthrow of supposed knowledge, but from the sudden acquisition of new knowledge. In a similar manner, the discovery of America destroyed the balance of power in Europe and compelled a readjustment.

One of the new things we have to learn is that some of the elements, like animals, have a life period, and this can even be calculated. It is estimated that radium, for instance, is decomposing at such a rate that half of it is transformed into other elements in the course of 1300 years. Radium is thus not only very expensive, but perishable. Uranium is also decomposing, though at a much slower rate, one half in 600,000,000 years. It is thought that lead is the result of the decomposition of uranium and radium; and polonium is believed to be the last stage in the disintegra-

tion series between radium and lead.

Another interesting fact is that all this disintegration means the existence about us of untold stores of energy. It is true that we do not yet know how to utilize it, but a recognition of its presence is the first step in that direction. We may not be forever dependent for heat and power upon the deposits of coal, the force of water and the heat of the sun, for the energy of decomposition is much stronger than the energy of combination. In fact, it is said that the energy involved in the disintegration of an element is a million times greater than any form of chemical energy of combination known to man. A piece of radium the size of a pinhead, if decomposed all at once, would equal the explosion of a hundred weight of dynamite. A piece of lead the size of a button, if we could get at its internal energy, would suffice to propel the largest ship across the ocean. But so far as our researches have gone, it appears that the decomposition of an atom is spontaneous and independent of external conditions. Neither by heat, shock nor electricity can we cause or prevent it.

New theories of matter result from these discoveries—for example, that inertia is an electrical phenomenon and perhaps changeable—and open vistas attractive to the philosopher as well as to the engineer.

## Practical Road Building.

It has been well said that good roads mark the line between barbarism and civilization in any country. Judged by this standard, America cannot be considered to have advanced far from savagery; but the "good roads" movement is spreading, if not as rapidly as might be desired, at least as fast as can be expected when it is remembered that a preliminary education of the people to an appreciation of their own needs is necessary. A national association for the promotion of this object has been formed, and is doing good work: Congress takes an occasional interest in the matter, and the Department of Agriculture is doing all it can to advance the cause. The automobile promises to be an important factor in road improvement. Public opinion in general is being awakened to the practical value of good highways.

The best possible advocate for the system is a well built piece of road in each community. The chief drawback is frequently an exaggeration of the difficulties, and a lack of knowledge as to the practical details of the work in the minds of the rural community. The following description of a typical piece of road construction may therefore prove of general interest.

The road having been located and graded and the curves straightened, the first work is to roll it with a steam roller, which rounds the dirt to the center. A small force of laborers follow to dress the surface accurately to the lines. The road is again rolled until the surface no longer yields, all depressions being filled with earth as they appear, so that the foundation may be as solid as possible. The first course of stone, about four inches in

thickness, is then applied. It is of a size that will pass through a 3-inch ring. The stone is wet before rolling, the practice being to sprinkle it thoroughly, by means of a convenient hydrant or stream. This is applied and pressed into place, the edges being first rolled and the center gradually approached, as by this means the material is more thoroughly compressed and the crown is retained. A second layer two inches thick, half the size of the first, is then spread on as evenly as possible, being thoroughly wet and rolled as before. All depressions are then filled with the same material, and after rolling smooth, still another course is added, the material used being fine screening, varying in size from that of a pea to the smallest particles. This last course is then wet and is rolled until the whole is thoroughly compacted and bonded into one concrete mass, having a thickness of six inches at the center and four inches at the sides. Only a sufficient quantity of this fine stuff should be used to insure the filling of all voids and to properly bond the top course, a common error being to apply it unevenly or to an excess, which causes it to "pick out" in holes and wear badly.

Care must be taken to see that the road is properly ditched and drained, as no road can stand, however well it may be built, where the all-important question of drainage is neglected. An eminent authority has described a good road as "one with a tight roof and a dry cellar." Some of the old Roman roads, built of heavy stone and mortar, have a thickness of three feet; but the best modern road builders have demonstrated that it is no longer a question of how much is put on, but how well it is put on.

While binding power is possessed by many materials, there are instances where failures have occurred in road construction solely on account of the selection of material which, while possessing great hardness, would never bond. Tests have developed the fact that with many rocks, continued grinding while wet produces a high cementing power. Microscopic examination reveals a substance resembling glue.

A bureau in the Department of Agriculture has been created for the purpose of examining the fitness of material for road making, and it is able to report just what rocks possess a "natural bond"—a service which will prove of incalculable benefit to road builders.

When a community decides to improve its roads, the local authorities can apply to the road bureau, which, after tests, of the available materials, tells them what will be the best and cheapest road to build. Most communities have some sort of stone from which to make roads. There are three qualities stone must have, if it is to be of any service—hardness, toughness, and binding qualities. To determine the hardness of stone, a round pencil of it is cut out with a diamond drill, and it is put into a machine that forces it at a fixed pressure against a rapidly revolving plate covered with a standard grade of emery or other abrasive. After a certain



time, the core of stone is measured and its hardness accurately determined. For testing toughness, another machine is employed. This is built like a miniature pile driver. A small hammer is raised and allowed to fall on a round section of stone such as was used in the test for hardness. The little hammer is raised farther each time and allowed to drop on the stone till the latter is broken by the impact.

Then the binding quality is determined. The stone is ground to an impalpable dust, mixed with water and molded into a small cylinder. This is put under one of the little hammer machines and tested till it is crushed by the blow. Some stone breaks at the first stroke; other endure the test well, showing that they would make good surfaces for roads.

There is another curious machine, devised by the French school of roads. It consists of a lot of heavy iron pots that can be bolted to a zigzag revolving shaft. These are filled with samples of stone of a standard size, and the whole set to whirling on the shaft for an hour or so. Then the pots are emptied, the amount of dust produced weighed, and the expert is able to tell precisely the relative wearing qualities of the samples submitted.

In places where stone is scarce, burnt clay has been found to offer good road material. Clay, when burnt, loses its power of getting sticky under the action of water, and becomes an aid instead of a drawback in solving the good roads problem.

In making bridges, re-enforced concrete constructions are recommended. This latter material is coming rapidly into use. The spacing of the corrugated steel bars used and the thickness of the concrete are varied to suit the span and load, the concrete bearing the compression and the steel bars taking the tension strains. The corrugations of the bars prevent any slip or movement occurring between the concrete and the steel, thus insuring perfect union of the two.

In spite of a widespread belief to the contrary, nothing makes a better foundation for a stone road than sand, provided that it is properly ditched, so that when rain and floods come the sand is not washed from under—for, after all, sand is made up of minute particles of stone. Heavy embankments have been built entirely with sand taken from some convenient source of supply, and after completion, only a few inches of soil were spread over the whole before adding the stone. The sides of the embankments are planted with Bermuda grass, or wild honeysuckle, which holds the soil and prevents washing. No finer roads are to be found than those built on sand, as it provides an excellent underdrain.

#### Ingenious Cuspidor.

The tuberculosis commission has been examining a cuspidor invented by M. Fournier. It is of very cheap construction, and needs no cleaning or touching by hand. It consists of a cardboard cylinder rendered waterproof, containing some pulverized peat, impregnated with an hygroscopic and antiseptic substance. This receptacle is provided with a lid, which rises on pressure of a small hand lever or foot pedal, and thus nothing objectionable is in sight, no dust can come from it, and flies cannot enter. When it needs emptying, it can be seized with a pair of tongs and thrown on the fire.

#### Artificial Albumen.

A NEW CONDENSED FOOD TO SUPPLANT MEAT.

It is contended that the principal nourishment required by the human body for its maintenance is albumen, according to the renowned professor of physiology, Pfeiffer, the source of all muscular strength. For this reason it has at all times been the endeavor of our learned men to obtain more knowledge of this important ingredient of our daily food. Up till now all such efforts have been in vain, but, it was recognized that were it possible to make artificial albumen, a complete change in the present system of nourishing the human body would be brought about and would render the now so necessary meat foods to a great extent dispensable.

Prof. Emil Fischer, director of the leading chemical institution, the Berlin University, has gained the credit of having accomplished the first analysis of natural albumen. He has established the composition of the various ingredients, some of which he has succeeded in producing artificially. The substance thus obtained he has called "Polypeptide," and is said to possess a large number of the properties characteristic of natural albumen. The vast importance of this discovery will be better comprehended when we realize that the introduction of this artificial food will reduce the disastrous effects of bad harvests, pestilence, etc., to a minimum, and cause famine to become a thing of the past.

#### The Sunflower as a Febrifuge.

A new agent for dispelling fevers has been discovered in the common sunflower. If all that is claimed for it be true, this is another instance of therapeutical properties possessed by plants generally considered worthless. Dr. Moncorvo, a French physician, has been experimenting with the flower for years, and declares that it yields an excellent febrifuge. The Russian peasantry are convinced that the plant can dispel fever, and fever patients sleep upon a bed made of sunflower leaves, and also cover themselves with them. This use has recently induced a Russian doctor to experiment with a coloring matter prepared from sunflower leaves, and he has achieved good results with it in cases of malarial fever. Dr. Moncorvo has also had satisfactory results with the coloring matter and with alcoholic extracts not only of the flower itself, but of the leaves. In treating a hundred children of ages varying from one month to twelve years, he has, in the majority of cases, effected as speedy a cure as when the quinine method was followed. It is believed that the product can be used most advantageously in combatting fevers and indispositions of a malarial character. The sunflower, it is of interest to note, is originally an American plant, having been first found in Mexico and Peru.

It may not be widely known that the sunflower is valued in Russia apart from its medicinal qualities. Sunflower seed is extensively cultivated in the Czar's domains, as the moujiks prize the oil extracted therefrom as an edible delicacy. The seeds are also roasted and eaten as peanuts are in the United States. It is stated on good authority that 700,000 acres are annually devoted to the cultivation of the sunflower in Russia, and that 150 mills turn out a yearly product of

some 25,000,000 gallons of sunflower oil. It will be seen that this flower, chiefly esteemed for its decorative purposes on this side of the ocean, is a factor of considerable importance in the rural economy of the Russians.

#### Electric Advertising Signs.

An electric light company in a city of about 40,000 people recently purchased a monogram or talking sign, and erected it in a prominent location on the main street. The work was completed and the sign ready for operation on the Saturday before Christmas,—a particularly propitious time to start an exhibit of this kind, as the street crowds were naturally larger than usual.

When the first word flashed out, people stopped to watch, and by the time the company had wished them a "Merry Christmas," a large crowd had gathered, which cheered enthusiastically. Finally, the assistance of the police was necessary to keep the street clear for the trolleys. The show lasted all evening, and was the one topic of conversation among the shoppers. On Sunday, the day after, the manager states, he received many telephone messages at his residence congratulating him on his success.

A further use to which the same sign is to be put is both interesting and novel. The manager noticed, on sending out the January bills, that several of his best customers had charges beyond the average, which, although due to the holiday season, promised to result in complaint and dissatisfaction. He immediately called on these people and offered to each of them, without charge, the use of his sign for one evening during the coming month. They were naturally much pleased. Two important results were thus accomplished,—a dissatisfied customer was converted into an ardent advocate of the company, and was led also to see the possibilities of advertising by an electric sign. As there is no better advertisement than a satisfied customer, the success of the talking sign experiment was assured.

A remarkable feature of electrical applications is the quickness with which they invade fields of human activity, previously long noted for conservatism. The use of the incandescent lamp in church illuminations is a case in point. During the early days of electric lighting the thought of lighting a church by electricity was regarded as little short of sacrilegious by many people, and the suggestion of introducing special lighting effects about the chancel and altar was for a long time regarded as intolerable. Gradually these hostile views were lessened, as secular experience demonstrated beauty, cleanliness, and entire inoffensiveness of electric illumination, until today we find some of the most artistic electric lighting in the world inside the doors of the church. Even the liturgy in the vicinity of the altar has been made more impressive by the tasteful introduction of special electric lighting effects.

Of late the illuminated sign has come into play in that class of church work which bears directly upon neighborhood problems. In the case of churches which are active in the week as well as on Sundays, the illuminated sign ought to be a real help, whether it is arranged as a transparency or as a changeable letter sign, announcing the main points of the meetings as they occur. Good taste is, of course, a most important consideration in the use of electric signs upon the exterior premises of churches. The cost of operating a sign is such a small percentage of the cost of lighting a church, that it ought to be an easy

matter for the central station man to extend his business in this direction. The Sunday night load comes at a time when the station output is low, and for this reason the business deserves pretty reasonable rates. The electric motor has invaded the church organ field to the lasting satisfaction of everybody; electric control of organ pipes enables the production of effects impossible in any other way through the saving of time which special keys permit, and even the telephone has been pressed into service in sporadic cases for the benefit of feeble ears. The electric sign is following suit, and from the mission chapel to the large church it ought to find a wide field of usefulness.—*Cassier's Magazine.*

#### Photography as an Aid to Sculpture.

It has occurred to many inventors that the camera could be made a most efficient instrument in the mechanical work of sculpture, and many efforts have been made in this direction. The results, so far, have been indifferent, but a step toward success has been recently made. Wilhelm Ohse, a merchant who has taken to photography late in life, has furnished another illustration of the fact that amateurs have done far more to develop the possibilities of the camera, than has ever been done by professionals. Mr. Ohse has studied out a method that bids fair to solve the problem of taking an exact, a minutely literal transcript of an object with the camera, not on a flat surface, but in absolute relief.

The principle consists in passing a screen during exposure between the artificial light by which the photograph is taken and the object which is photographed. The screen is so managed that the highest part of the object remains longest exposed to the light, and the other parts are illuminated more or less according to their relative position. From this plate the image is transferred to a diapositive plate; in turn the image on the diapositive is transferred to a chromogelatin plate. When this third plate is treated to the bath, those parts which have been illuminated longest, namely, those which in the object are highest in relief, swell up the highest, and all the other parts in minute gradation rise in their relative order. The result is a gelatine relief exactly like the original object, from which a mold can be taken in wax or plaster and used like any other mold for casting.

This marks the second step of progress in the mechanical process of sculpture, the first being the substitution of machinery for the hand chisel. Up to a few years ago, all work in marble or granite was slowly and laboriously performed by the human fingers. Under the new order of things, tools operated by some motive power cut away the hard stone and carve figures, letters, etc., in an amazingly short time.

The tools usually employed in this work are run by compressed air, instead of electricity or steam, the former power having obvious advantages. A combination hammer and chisel does most of the work, the hammer striking hundreds of blows per minute. Of course, a workman holds the pneumatic tool and guides it back and forth on the stone, wherever it is desired to cut. The compressed air is supplied through a rubber hose, and the operator can quickly and with the greatest ease, regulate the force of the blows, according to the depth of cut desired. Michael Angelo would be as surprised to see the rapidity with which a piece of sculpture is produced by this method, as Gutenberg would be at the operation of a linotype.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Noah Early, Jr., Chicago, Ill. Gate.—The improvement covered by this patent relates particularly to mechanism for opening and closing swinging gates at a distance from either side of the same: it is readily applied to any ordinary swinging gate, and it insures a positive closing movement, and effectually prevents the gate being left partly open. A guide is arranged at right angles to the gate, when the latter is closed, and a bar, which is pivotally connected with an arm of the gate, slides along the guide and forms a lock for holding the gate in its closed position. Operating mechanism moves the slidable bar in one direction, and a weight actuates the bar for moving the same in the opposite direction.

Clark M. Terrell, and Oliver M. Terrell, inventors, George, N. C.; Carolina Pine Fibre Co., George, N. C. assignees. Method of Treating Pine Needles.—The present invention relates to a method of treating pine needles for obtaining fibre, pine needle oil and extracts, and it enables pine needle fibre of a much finer character than has heretofore been possible, to be rapidly produced. It also enables a larger quantity of pine needle oil to be obtained from a given amount of pine needles, and it prevents the oil from evaporating or becoming mixed with the water, while it is being collected, whereby pure oil of great strength is obtained, and the necessity of rectifying the same is obviated. The method consists in subjecting the pine needles to the action of a machine to lubricate the oil and obtain the extract, crushing the needles to remove the wood from the points thereof, shaking the fibre and sifting the same to remove the dust and waste, and washing, and wringing and drying the fibre. In the treatment of the pine needles, the latter are converted into fibre balls, which are agitated to render the fibre fluffy.

George D. Hayes, Hillsboro, Tex. Baling Press. Two patents.—The baling press of the first patent improves the mounting of the plunger operating lever, so as to insure a quick and positive disengagement of the lever from the plunger rod at the completion of the stroke, and at the same time, prevents any twisting of the lever. The baling press comprises a re-bounding plunger having a socket or seat, a plunger actuating lever having an antifriction roller normally situated in the seat and adapted to automatically trip therefrom at the completion of the forward stroke of the plunger, means for automatically shifting the fulcrum of the lever during a portion of the movement of the plunger, means for holding the fulcrum against movement during the completion of the stroke of the plunger, and means for preventing the anti-friction roller from moving in the socket or seat of the plunger.

The second patent dispenses with the long operating lever heretofore employed and also the large springs, which were arranged above the press to effect the retraction of the lever. The press comprises a press box, a plunger, an operating toggle, a cable having running connections with the toggle at the joint thereof, and means for effecting the automatic disconnection of the toggle from the plunger at one limit of the movement of the latter.

Charles A. Mansfield and George D. Hayes, Hillsboro, Tex. Combination Heater.—The heater covered by this patent is designed for different uses. It is submergible in water, so as to heat water in a bath-tub, wash-tub, or the like, and by detaching the enclosing casing, which protects the flame when submerged, the heater may be used for ordinary purposes. The device consists of a base, above which is supported a burner. This burner is supplied with oil from a tube rising from the oil supply passage in the base, and passing over the burner to constitute a vaporizer, the heat generated by the burner serving to vaporize the oil as it passes through the tube to the burner. The base is provided with a depression which constitutes a starting cup, and has an upstanding annular flange to which is detachably connected a hollow combustion chamber, enclosing the burner and oil tube and having inlet pipes for fresh air and an outlet pipe for the products of combustion. When the heater is submerged, the pipes extend above the surface of the water, and when the combustion chamber and pipes are removed from the base, the burner is exposed and may be employed in the manner of an ordinary heater. The entire device is extremely simple in construction, adapted for economical manufacture, and efficient in operation.

Raymond C. Coburn, Upper Sandusky, Ohio. Laundry Apparatus.—The object of the invention is to enable the washing mechanism to be arranged in either wood or sheet metal tubs, and it prevents the latter from bulging outward at the points where the washing mechanism is connected to it. The mechanism consists of a horizontal adjustable section, extending beyond the washing mechanism, a clamp composed of opposite parallel bars having inner horizontal portions, upright intermediate portions and outer horizontal portion projecting from the intermediate vertical portions and provided with depending jaws, having projecting spurs to be embedded in the sides of a wooden tub and forming shoulders to lie under the strengthening wire or rod of a sheet metal tub, a transverse piece connecting the intermediate upright portions of the parallel bars and forming a support, an adjustable jaw interposed between the transverse connecting piece and the said jaws, and an adjusting device mounted on the transverse connecting piece and connected with, and adapted to actuate, the adjustable jaw for engaging the same with the inner face of a tub.

Raymond C. Coburn, Upper Sandusky, Ohio. Inhaler.—The invention covered by this patent relates to improvements in the class of inhalers employed in administering anaesthetics. Heretofore it has been the custom to employ one inhaler for the nose, and another for the mouth, and one of the principal objects of the present invention is to provide means, whereby one device can be used for either or both purposes. The inhaler consists of slidably associated rigid sections provided with means for holding them against sliding movement and in different adjusted positions. The upper section has a top partly formed of flexible material, and furthermore has an inlet, to which a supply pipe can be connected. The bottom of the lower section has a depending nipple provided with an outlet, and means for varying the size of the outlet in order that the same may be adjusted to the respiration of the patient.

Raymond C. Coburn, Upper Sandusky, Ohio. Apparatus for Administering Anaesthetics.—The primary object of this invention is to produce an extremely simple and compact apparatus which may be

shipped in knockdown form, and which, when set up, may be so compactly arranged that it may be packed organized for instant use, in a small case to facilitate its transportation. The device is so constructed that the gas bags may be supplied with nitrous oxide or oxygen, as the case may be, from any of a plurality of cylinders or receptacles, so that, when the gas in any cylinder has been consumed, the bag may be supplied from another cylinder without loss of time or the necessity of putting a new cylinder in place. The device comprises a base, from which rises a detachable standard, which is formed in sections capable of being disconnected to facilitate the packing of the device in a small compass. The upper end of the standard is provided with nipples for the attachment of gas bags, and with cylinder holders, each having a valve-controlled pipe in communication with one of the nipples. The nipples communicate with the connection of an inhaler tube, and the passage of gas from the cylinders to the inhaler is controlled by valves. The standard is also provided at its lower end with a retaining device for the lower ends of the cylinders, so that when the device is organized for use, it may be carried from place to place without danger of displacing the cylinders.

Charles E. Swett, inventor, Providence, R. I.; Robert H. Hutchinson, assignee, New York City. Process for the Recovery of Wool Fat.—The process originated by Mr. Swett is of considerable interest for the reason that he has made it possible to remove the wool fat from the suint in wool wash water in a manner to avoid the objectionable odor and dark color which are characteristics of the fat recovered by ordinary methods. Furthermore, the fat is not only recovered in better condition, but the recovery is more complete. The process consists in adding to the wool wash water, an alkaline manganate or permanganate as an oxidizing agent, next adding an acid to neutralize the alkalies, next removing the magma and eliminating the excess moisture, and finally treating the residue with a volatile solvent to recover the fat.

Joseph H. Harrell, Charlotte, N. C., Electric Signalling System.—This patent discloses an electric signal system for railroads, and is designed to eliminate the possibility of collisions between railway trains by providing means, controlled by train movements, for automatically operating a visible or audible signal device on the train when the latter is in dangerous proximity to an open switch, or to a second train located on the same track. The railway system is divided into blocks which, by means of electrical connections, are made to overlap. These connections include line wires, and a series of sets of contact devices disposed at intervals along the road bed. The corresponding devices of the several sets are in electrical connection with the same line wire. Upon the locomotive is mounted a battery and shoes, which constitute battery terminals, and another locomotive carries a signal and similar shoes. When one train approaches another on the same track, the shoes of the two locomotives will contact with contact devices of the same line wires, thus placing the signal device on one locomotive in circuit with the battery on the other. This will obviously cause the signal device to operate and apprise the engineer of the danger. It is contemplated to equip both locomotives with signals and batteries so that the signal will be sounded on both vehicles, and a somewhat similar arrangement is provided for apprising the engineer when the locomotive approaches an open switch.

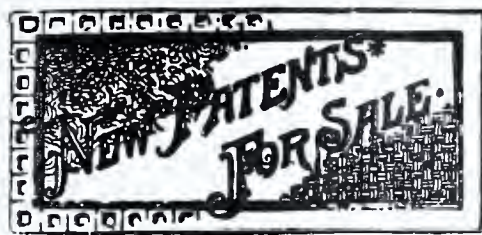
John C. Bridgmen, London, Ohio. Combined Shaft Support and Anti-Rattler.—It is the aim of the present invention to provide a device for holding the shafts of a vehicle in an elevated position, and for preventing the parts from rattling. The combined shaft support and anti-rattler comprises a spring having a depending loop, located beneath the thill coupling and provided at one side with means for connecting it to the axle, its other side being arranged to bear against the eye of the shaft or thill, and extending above the same to form an arm, and a catch mounted on the shaft or thill, and adapted to engage the upwardly extending arm when the shaft or thill is elevated. In the present device, a single spring engages the eye of the shaft or thill to prevent the parts from rattling, and co-operates with the catch for holding the shaft or thill in an elevated position.

Henry M. Ramer, Labott, Pa. Hay Rake.—Mr. Ramer's rake is of simple and efficient construction, and the parts are so assembled that their displacement and replacement for repair may be effected by unskilled persons. The rake frame is pivotally mounted in the comb frame and is provided with rake teeth, the comb teeth extending as usual in a rearward direction from the comb frame. A crank shaft is mounted at the rear side of the comb frame and is connected with the front bar of the rake frame. The crank shaft is rocked to operate the rake frame, by a lever so arranged that when the rake frame is elevated, the crank will be in rear of the shaft in order to hold the rake frame in its elevated position.

Manuel C. Machado, Morro, Cal. Riveting Machine.—The device of this patent, although useful for any character of leather riveting, is especially designed to facilitate the attachment of the box or keeper loops to harness straps. The machine comprises a substantially U-shaped body, having its opposite ends provided with interiorly threaded and aligned tubular bearings, a threaded plunger working in one of the bearings and provided at its outer end with a hand-wheel, a threaded stem working in the opposite bearing, and a work holder. The work holder embodies an arm, lying substantially parallel with the stem, and provided with an outer lateral projection, swiveled to the outer end of the stem, and a pair of inner and outer holder jaws projected laterally from the opposite end of the body, the inner jaw being swiveled to the inner end of the stem and the outer jaw having an anvil upon its outer side. The work holder is adjustable with respect to the plunger, so as to accommodate different thicknesses of leather and different lengths of rivets.

Herman W. Steinmann, Waco, Tex. Boll Weevil Exterminator.—This machine is one of the most efficient yet devised for the extermination of the boll weevil. The device operates something after the manner of a straddle row cultivator. It includes a wheeled vehicle from the frame of which two receivers are suspended. These receivers are located at opposite sides of the row of plants and adjacent to the ground, and are equipped with burners whereby the insects and infected vegetation deposited in the receivers will be immediately destroyed. The burners are supplied with fuel from tanks mounted on the vehicle, and the insects are brushed from the plants into the receivers by rotary brushes which are driven from the vehicle wheels as the vehicle is drawn over the ground. The most notable feature of this machine is the fact that the insects are destroyed at once, instead of being collected and subsequently destroyed in the ordinary manner.





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Wheel..... J. W. Meixell  
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Window fastener..... W. F. Gilbert  
Wire connector..... C. L. Pierce, Jr  
Wire drawing machine..... J. A. Horton  
Wire tie..... A. J. Baker  
Wires. Dyes for tying intersecting..... E. J. Bowerfind

## DESIGNS.

Badge..... F. B. Bower

Badge. Cane..... N. Shure  
Lamp body..... 2 pats. E. M. Rosenbluth  
Stocking receptacle..... S. Greenleaf

## Canadian Patents.

Canadian Patents may now be obtained by the inventors for any of the mechanical inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated, the cost will be a little more. For full instructions address Inventive Age Publishing Co., 918 F Street N. W., Washington, D. C.

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## Artificial Aging of Brandy.

Professor Martinotti, of the Royal (Enological Station of Asti, recommends the following method for the artificial aging of brandy:

Ordinarily brandy, before being bottled, is aged by keeping for the requisite length of time in small oaken casks, from which it absorbs certain ethers and essential oils contained in the wood, and necessary to its perfection. By the method of Professor Martinotti, fine shavings of oak are placed in the cask with the new spirit and allowed to remain for one month, the cask being occasionally turned over. At the end of this time, the liquor is filtered and decanted into white glass bottles, which are filled about two-thirds full, and, after being very lightly corked, are placed in an inclined position, care being taken that the brandy does not touch the stopper. By this means the largest possible surface is exposed to the action of the air, and the oxidation necessary to produce good brandy is materially hastened. The action of the light plays an important part in the maturing of spirits, but bottles should not be exposed to the direct rays of the sun and should be kept in a sufficiently cool place to avoid excessive evaporation.

An invention of great importance to interested industries was made a few days ago by a Gablonz experimenter—a substitute for the widely used celluloid, which, on account of its inflammability and high price, as well as the lack of other desirable qualities, cannot always be used in ways desired. The new invention overcomes all shortcomings, although retaining all the desirable qualities of celluloid. The substitute is but little dearer than glass, which is much cheaper than celluloid, and of about the same weight. The new material is very elastic, absolutely noninflammable, and very easy to work by the turner. By a simple method, a lasting polish can be put on all articles made from it, which is a great advantage over celluloid. The material is absolutely without smell. The inventor is a young chemist who has made exhaustive trials of the material with the best results, especially as to durability in heat and permanency of colors under sunlight and in water. It should be mentioned that the material is a nonconductor of electricity and can be used for insulation. The invention promises to be of great importance in the whole celluloid industry.

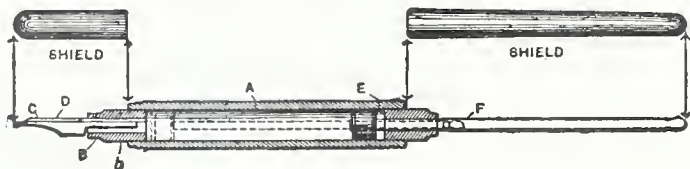


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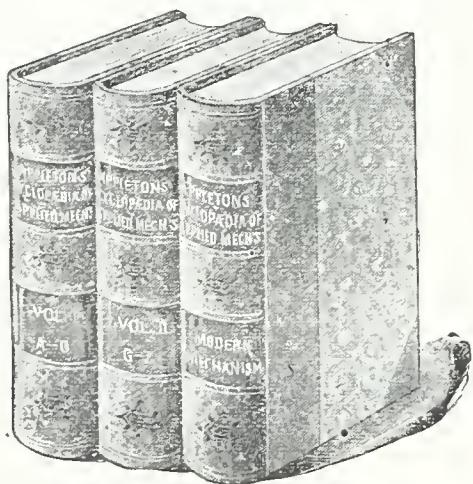
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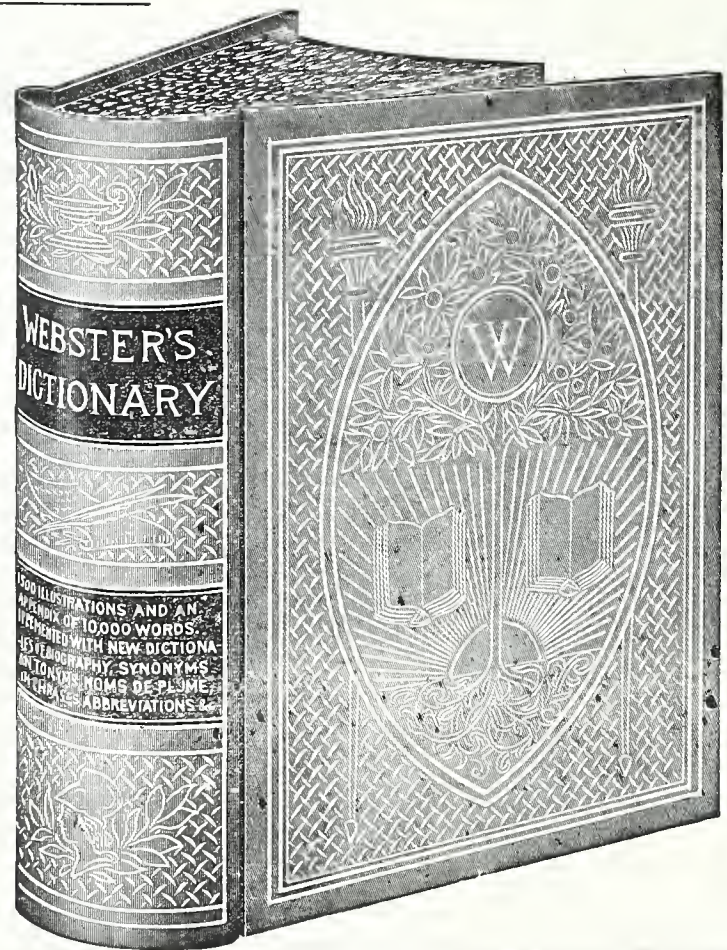
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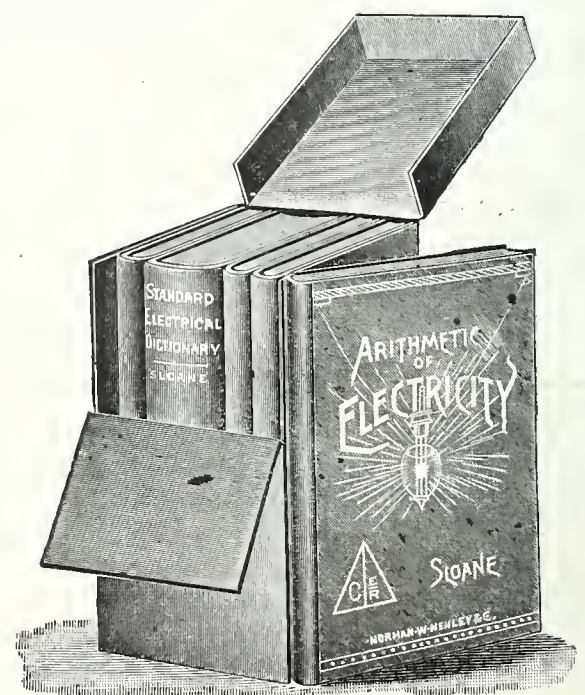
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A JOURNAL  
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# The Inventive Edge

AND SCIENTIFIC PROGRESS.

EIGHTEENTH YEAR. }  
No. 9.

WASHINGTON, D. C.—SEPTEMBER, 1906.

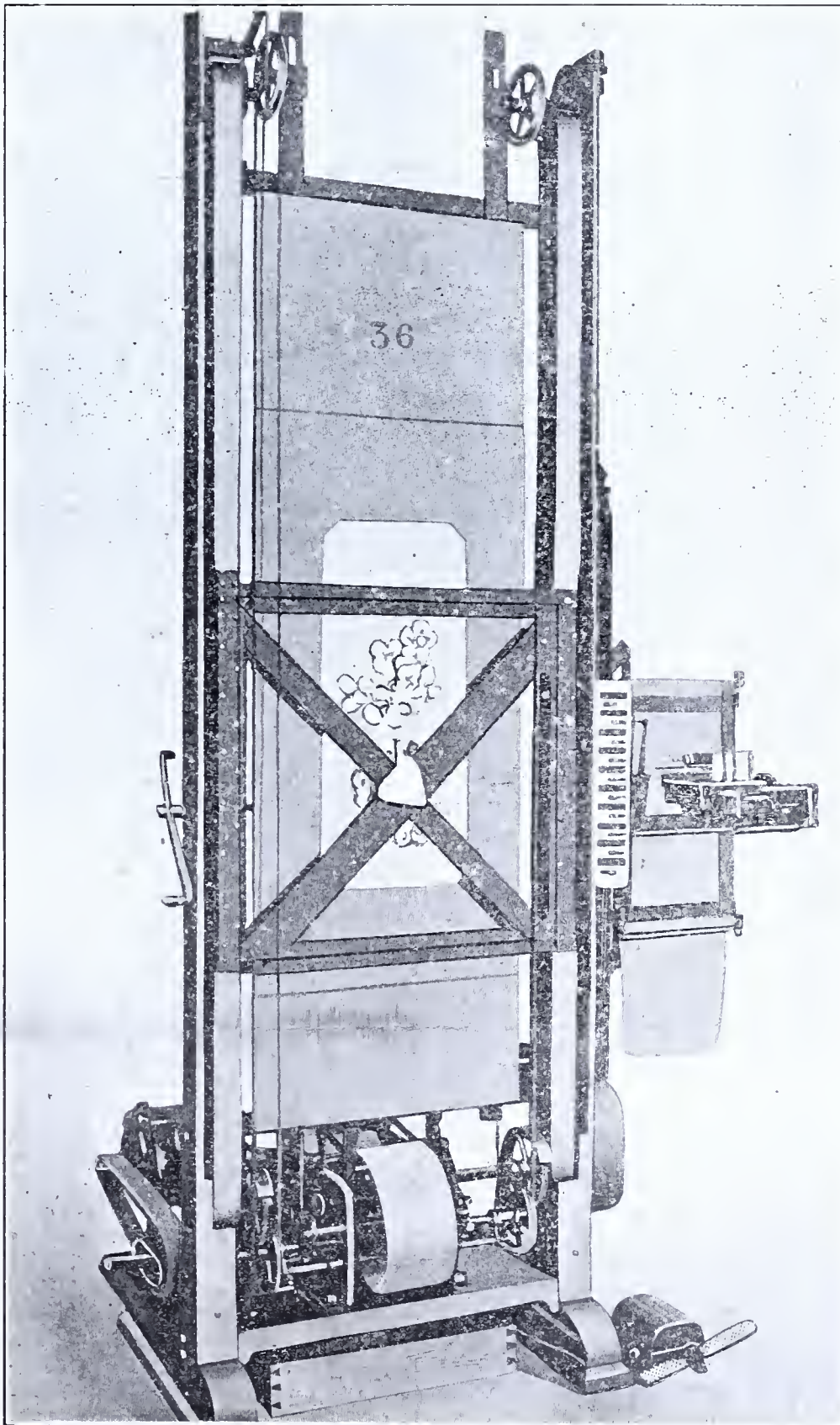
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## MACHINE LACE INDUSTRY OF GERMANY.

THE district of Plauen is the only one in Germany where lace is manufactured by machinery. The expertness acquired by its people through many generations of lace making by hand, seemed to offer fair promise of a profitable field for the introduction of modern lace making machinery, and about the year 1868 the first lace machines were introduced in this region from Switzerland, in which country their value has been fully demonstrated. This district now contains more than 7,000 machines of the several patterns hereinafter described, and has become one of the leading lace centers of the world. Following the direction of the lowest wages, the industry has gradually spread out from the center until the villages and hamlets of the surrounding mountains have also become dotted over with machine-lace plants, and in this way one or two neighboring districts have been invaded, though the real seat of the industry has always remained here, and the chance of shipments from other districts are mainly due to the efforts of American agencies located there to accumulate a number of orders in one lot.

What is now familiarly known as the "hand machine" for making embroidered lace is an ingenious device, invented by Joshua Heilmann, an Alsatian, about the year 1829. Though numerous improvements have from time to time been supplied, the principle of the Heilmann machine has remained the same, and it is the apparatus upon which the vast amount of cambric embroidery is turned out at St. Gall and elsewhere, though in Switzerland the 4-yard machine is more common, while in Saxony the 5-yard machine prevails.

"Burned out" or "etched" lace, which is the special product of the Plauen district, is not made upon this machine. In this machine a number of needles simultaneously trace or stitch a certain pattern upon a tightly stretched piece of cambric. This cambric is hung vertically in a movable frame, while on each side thereof are carriages containing two or three rows of needle holders, which alternately move horizontally to and from



the framed cambric. The needles are less than one inch in length, taper to a point at each end, and are threaded through an eye in the middle. The

movable frame pushes all the needles, clasped firmly at one end, simultaneously through the cambric material into a corresponding set of clasps in the opposite frame, which automatically close upon the points of the needles on that side as they are being released upon the other side, and moving away from the cambric frame, pull the thread through the material. A stitch upon the pattern is thus accomplished by each needle. By a similar motion, the process is thus reversed, and another stitch is made in the opposite direction. One operator produces the required power.

By an apt arrangement, machines for cambric embroidery are supplied with an apparatus for boring or driving holes into the cambric around which the embroidering is then done; also for rounding holes after completion of all stitches, and for adding to the embroidered pattern a line of festooning. The "borers" or "stillettos" are four edged, cone-shaped spears, about 2 inches in length, corresponding in number and order to the needles in bar, and so ranged upon another bar that they may be simultaneously moved forward and pressed through the cambric by a motion of the hand, the edges being sufficiently sharp to cut the material to the extent desired. The rounders are arranged and operated exactly like the borers, being of the same size and number, but round and smooth, so as to accurately fit and round out the holes previously cut and embroidered. The festooning apparatus is also disposed upon a long bar, and consists of a line of hooks or projections so arranged as to catch the thread of each needle when desired, and by giving a turn to the same, work a loose and shapely border around the finished embroidery.

The productive capacity of power-driven lace machinery being vastly in excess of that of hand-propelled machines, the power machine has long predominated in this district and by it the bulk of the lace which reaches the world from this busy mart has been produced. True, it is claimed, and with much reason, that some of the very choicest products are still made



upon the old-style hand machines, and that some, such as the multicolored silk embroideries, can be successfully turned out upon none other; but the fact that from ten to twenty times the number of stitches can be accomplished upon a power machine in a given time, has long since rendered the latter dominant in the larger plants and for the production of the staple wares. If it may be justly said that the hand machine produces a mere imitation of sewing by hand, it certainly is equally true that the shuttle machine is purely a multiplied sewing machine. Many points of similarity with the hand machine exist, especially in the movable frame for the material upon which the needlework is done and the pantograph attachment. In this machine, however, two rows of single-pointed needles are fixed in a carriage on the side near the observer which drives the needles through the material stretched in the movable frame, when they are met by an equal number of bobbin filled shuttles playing in a fixed frame on the opposite side, thereby producing a lock stitch precisely like that made by the modern sewing machine.

Not more than two rows of needles have, so far, been used in any shuttle machine, but its length has, step by step, increased from 5 yards to 6, 6½, 8, and 9 yards, and the leading machine shop of this district is just now engaged in building for the American market the first one, 10 yards in length. The pantograph on these machines is operated precisely as are those attached to hand machines, but, since the operator is saved the necessity of propelling the machine by hand, and of shifting its motion by foot, much more freedom of action is afforded him. He nevertheless traces generally the point of the pantograph over the enlarged pattern before him with his left hand, being ready with his right to throw the machine out of gear the moment that any possible interruption may require it. Here, again, all product is judged and valued according to the number of stitches required in completing it, and it has been considered a high grade performance for a skilled operator to turn out as many as 35,000 stitches in one day of ten hours, which through doubling the operation, means a total output of 70,000 stitches. This, however, may be regarded as a maximum performance, the average, on plain patterns even, being much nearer 20,000 stitches or 40,000 for two rows.

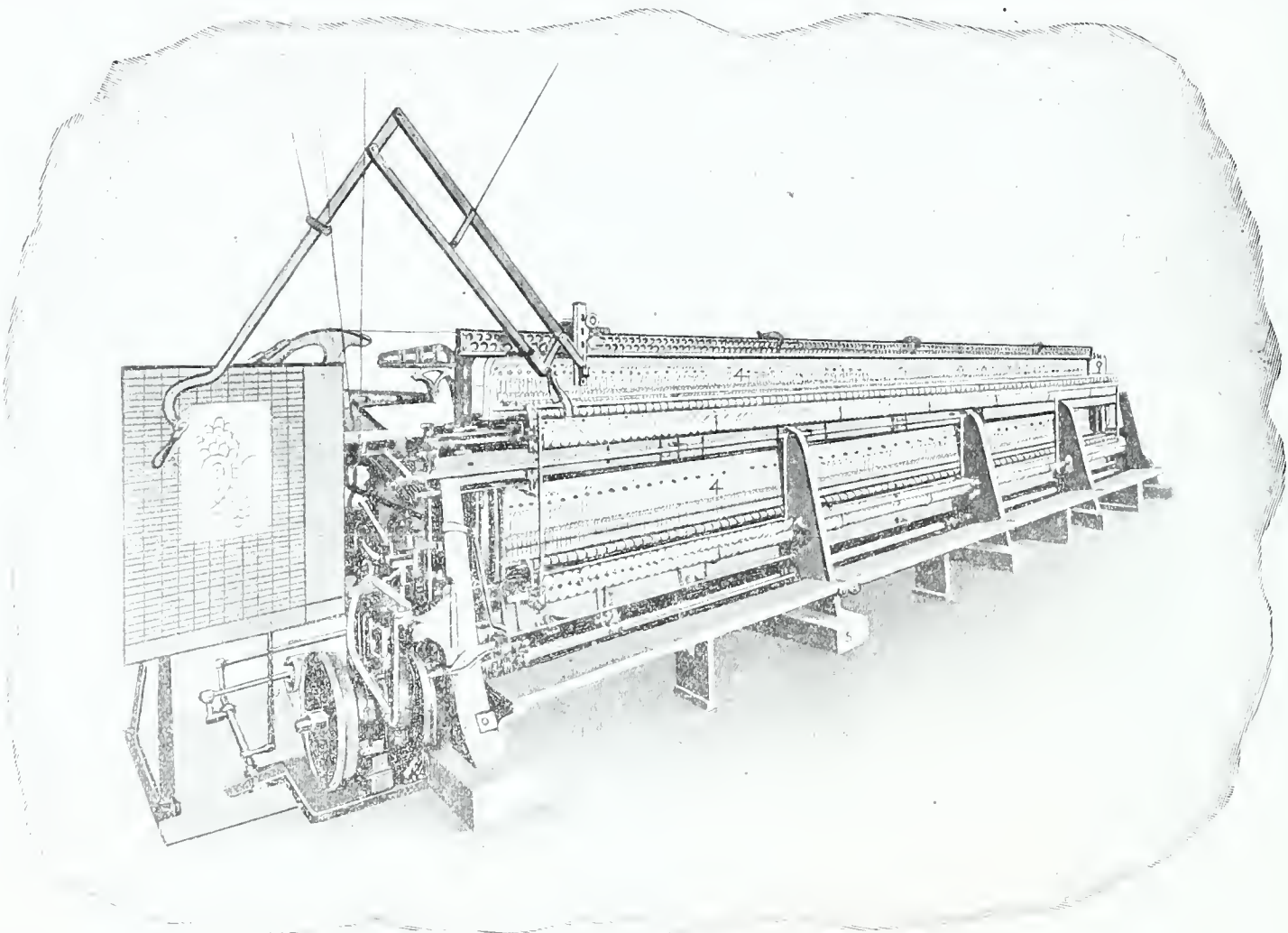
The shuttle machine was originally designed and used for the manufacture of a cotton guipure lace, which won universal recognition in the market; but local manufacturers have not stopped there, and are now turning out surprisingly skillful imitations of almost every other quality of lace known, whether the material be cotton, linen, silk or artificial silk. In every instance it may be said however, (except in very light tracings upon very strong netting) that the pattern must be worked upon a base of woolen muslin, usually of pinkish color, which is stretched in a vertical frame, and after the completion of the lace work upon it, etched or burned away

by immersing the whole product in a strong chemical solution, (usually caustic soda) which completely dissolves the animal fiber and leaves the vegetable fiber unaffected. Conversely, silk laces are worked upon a base of vegetable origin, and the etching or burning is accomplished by chemicals which destroy the base, but preserve the rest of the fabric. Linen laces are treated substantially as are those of cotton. Experiments have been conducted recently with a view to accomplishing the "burning out" by the application of dry chemicals in a dry state, and a very fine finish has been attained; but some trouble has resulted from the inability to entirely eliminate the chemicals from the material. The process has remained a secret. Strong netting, upon which a faint pattern is worked, is sometimes

tion. It will be understood that the Jacquard invention involves the production of given patterns through the use of perforated pasteboard cards or strips. Originally the system was applied in the art of weaving alone, wherein these cards were instrumental in alternately raising and lowering such threads of the warp as were active in the production of a given pattern. A shrewd adaptation of this device to the shuttle machine causes an automatic movement of the swinging frame so as to work out the precise design desired.

About 250 of these machines have been installed in the Plauen district, and an equal number at St. Gall. At the latter point however, they have so far been only used in the production of cambric embroidery: but owing to restrictions upon the sale of the pat-

An essential auxiliary of the automatic machine is the little mechanism by means of which the design given lace pattern is punched into pasteboard strips for use in the Jacquard attachment. An enlarged drawing of the pattern, exactly similar to those used with the pantograph shuttle machines, is spread upon a vertically hung canvas, and simultaneously with the passing of a needle point (attached to a movable frame) along the stitches called for by the drawing, the card-board roller at the bottom of the apparatus is correspondingly perforated, while to the right of the operator, and for his guidance and information, a single needle and shuttle concurrently work out a sample of the design upon a strip of the usual material. It goes without saying that only operatives of high skill and intelligence can be utilized for this delicate and responsible task. The services of one such expert suffice to keep



stretched in the movable frame without the addition of the woolen base or tissue, but the cases are comparatively rare in which the result justifies the saving involved. Cambrics may be generally stretched in the frame and then embroidered. Naturally, therefore, cambric embroidery produced upon these machines requires only the same manipulation as that produced on hand machines. The several frames entering into the make up of this machine are so hung as to allow of the introduction of the borer, rounder, and festooner heretofore described, and most of the modern machines of eight yards or more in length are supplied with automatic borers.

What is now claimed to be the most perfect and productive lace making apparatus is the shuttle machine last described, further supplied with and directed by a jacquard attachment. Anyone familiar with the jacquard will recognize the method of its use on these machines and will appreciate to what extent the efficiency of the machine has been raised by this combina-

ent, none have yet reached the United States. It is contended that one direct advantage resulting from the use of Jacquard appliance is an increase of about 25 per cent in productive efficiency. Others are the alleged greater regularity in the execution of the design, and the saving of the cost of a skilled operator for each machine, whose wages are usually the highest in the shop. Boring, rounding and festooning attachments can be applied to the automatic machines as well as to the pantograph shuttle machines.

Concerning all the classes of shuttle machines it may be said that designs requiring a greater "play" than is possible with the 64 rapport machine may be worked by removing alternate needles, thus really creating 8-4, 12-4, 16-4, or 24-4 rapport machines for the time being. As is well understood in lace circles, wide patterns in other than net tops are produced by skillfully fitting together narrower strips of patterns into larger and more pretentious designs.

from ten to twenty automatic machines supplied with an adequate number of pattern cards. By an additional device, it is rendered easy to copy any given design an unlimited number of times, in case more than one machine is to be set in motion to turn out a particular (or hurry) pattern, or the original card has become defective.

Another mechanism now commonly used in all larger lace factories is a patented spool winder and shuttle filler. These small and exceedingly delicate machines rapidly and accurately wind the spools, insert them into the shuttles, and then transfer the filled shuttles to belts similar to cartridge belts, out of which they are fed into the looms.

The ever-changing demands of a fashionable world cause a constant rotation in the designs and qualities of lace manufactured. As a consequence the number of lace patterns has grown to astounding magnitude, some authorities assert that there are not less than 3,000,000 in this district alone, and the manufacturers are kept in a continuous state of anxiety to catch the latest intimation of fashion's decrees. It will seem obvious that the establishment of a successful lace-manufacturing plant involves vastly more than the mere installment of so many looms.



## AN ELECTRICAL NURSERY.

A most unique scientific institution has been established in New York City, in the form of a laboratory where the value of inventions, especially in the electrical line, can be tested. A generation or so ago, a man who spent his time—as Edison does today—in making ceaseless experiments, would have been called a crank. The world has come to recognize the value of such labors. No longer is a scientist despised for making apparently futile investigations. The story is told that Faraday, to whose efforts we owe the electric dynamo, was often asked by his friends as to the use of his seemingly endless experiments, until he finally silenced them by the unanswerable counter-question "What is the use of a baby?" The "baby" of Faraday's intellect has become the enormous turbo-generator of the present age—electrical machinery of 10,000 horse power, driving cars and lighting cities hundreds of miles from the source of power. Today, the investigator does not need to justify his interest in a scientific infant; he can take it to an electrical hospital, where it will be watched by specially trained nurses and doctors.

For years there have been electrical testing laboratories attached to the Brooklyn Navy Yard and to the workshops of the Pennsylvania railroad. These have performed the special function of examining electrical supplies, but they are naturally not at the command of the private investigator. The need of some such institution became so marked that a company of well known electricians has opened a completely equipped laboratory in New York. It is said to be the best scientific nursery in the world.

The chief department of this laboratory is devoted to determining the lasting qualities and illuminating powers of electric lamps. In the large room where these are tested, 3,000 lamps are kept burning day and night. They are arranged closely together in alcoves, and each alcove is a veritable electric bath, in which the radiations from the globes maintain a steady temperature of more than 100 degrees F. In spite of this temperature, a visitor to this room experiences a feeling of exhilaration. It would seem that never before has so much brilliancy been concentrated in so small a space.

A corps of attendants care for and examine these electric babies at regular intervals. Each is known by name and number, and at the side of each, as in the ward of a hospital, is placed a diagnosis card, on which the progress or decline of the patient is carefully recorded.

The first question asked about a patient is "How long will it live?" that is, how many hours will the lamp burn without breaking down the filament or exploding the bulb? Some lamps have been burning steadily for years and are still in good condition. Others last only a few hours, and have to be returned to the inventor for rehabilitation.

The next inquiry about incandescent lamps is, "How long will they continue in perfect health?"—or, how long will they maintain their normal appetite for current before they begin to dim? The statistics that are collected on this point are of the greatest value to manufacturers. Sometimes a wasting disease, the cause of which has not yet been discovered, a subtle deterioration of the filament—a kind of yellow fever, as it has been jocularly called—afflicts a lamp, so that after a certain time it consumes proportionately more current for the less light given. Hence all kinds of data are being collected as to different filaments, working at various electrical pressures. These data are ultimately given to the manufacturer of the lamps, who, knowing the precise conditions under which they were made, is able to improve his methods.

One particular family of incandescent lamps was found to be infected with a peculiar malady. In general, the health of all the group was normal, but when the filament did break down, it was usually found to break at a point about an inch from the place where the wire is fused into the glass. The manufacturer of these lamps, instead of being puzzled, was able at once to place his finger on the weak spot in his factory process. The next batch of lamps behaved much better, and still further investigation showed that 90 per cent of the lamps broke down at the point where the filament joins the wire. Again, he was not distressed over the decease of his children. "They must break somewhere," he said, "and now they break just where we want them to," and a comparison of records showed that these perfected lamps had an all-round improved illuminating quality.

Filament lamps are all tested in a horizontal position in order to determine whether the filament droops. They are also examined once a day through colored glasses to note the formation of weak spots in the filament, and once every four days to determine their illumination. This last test is practically automatic. The lamp is taken into a darkened room and attached to a rotating spindle. It is so placed that its light shines upon a screen, on the other side of which is a lamp of standard candle power. Each lamp projects its light upon the screen, and by moving the standard lamp nearer or further away, the resulting shadows are equalized, and an indicator on a scale demonstrates the degree of illumination. Other tests are from time to time in progress to determine the character of the residual gases that remain in minute quantities in the lamp after it has been exhausted.

Arc lamps are tested in a room seventy-five feet long, by means of a number of most ingenious mechanical devices. By a clever arrangement of mirrors, the light from all parts of the lamp is thrown simultaneously on the screen of the photometer, which measures the light. The principal ques-

tions demanded of an arc lamp are: How does it burn? Does it distribute the light evenly or otherwise all around? Does it afford a better illumination when it is hanging at a certain distance above the street? Does it give different illumination at different angles? Does it work better from direct or alternating current? And finally, how much does it cost to run?

It is found that an arc lamp does not obtain its maximum power until it has been burning for thirty minutes. The lamps are therefore arranged on a kind of overhead trolley, so that they can be moved in and out of the photometer room one at a time, without turning off the current. The scale on the arc lamp photometer is ten feet long. When a lamp is being tested, the operator touches a button at the right moment and a needle point automatically perforates a strip of paper to indicate the exact candle power.

The Nernst lamps burn on a rotating ring, so arranged that any individual lamp can be brought over and dropped into the dark light-proof box at the back connected with the testing apparatus in the adjacent room. Some of these Nernst lamps, in which the carbons are inclosed in air tight globes, have burned for six weeks at a time, as compared with the nine or ten hours' duration of the ordinary type of arc lamp.

But the laboratory is not entirely devoted to the testing of lamps. In another department is a large room containing a number of mysterious looking bars of solid copper, some of them four inches thick. When the visitor is told that these harmless looking rods placed within easy reach of his hands, are charged with enormous currents, he is not surprised at the hushed solemnity with which this cabalistic worship of invisible forces is conducted. Two assistants are performing mystic rites before an electrical altar. They are twisting wires and interpreting diagrams, and when all is ready they place a small object in a glass cabinet and carefully close the doors. A tiny coil is seen reposing quietly on a marble slab within. Nothing unusual happens. There is no movement, no sound; but with the closing of the door an automatic switch is operated, and the death-dealing force which the electrician calls 150,000 volts is set to work to test the weak points in the insulation of the coil. There is no substance through which electricity will not pass, and the main purpose of this cabinet is to discover which substances retard it most.

Hidden away behind the cabinet are five harmless looking cart wheels, bound round with numberless wires. These are the dynamos, each giving 2,000 volts. Their united power would probably kill a dozen elephants, if any one wished to test the electrical resistance of the inhabitants of a menagerie. Near the dynamos are two large coils of rope. These coils, worth thousands of dollars, are the transformers, immersed in oil, silently and mysteriously multiplying twelve-hundredfold the pressure from the dynamos.

Electrical insulators are tested for the special work they are called upon to do. For the low tension currents used in telegraphy, a simple glass knob or bottle head suffices; but for the high voltage currents employed by electric railroads, heavy porcelain insulators are required. Insulators, before being pronounced "not guilty" of the crime of allowing the current to escape from them, are submitted to all the tortures of a Spanish inquisition. They are baked in an electric oven, frozen in an ice chest, and only pronounced fit for service when their resisting qualities are measurable in millions of electrical units.

The graduation exercises of electrical meters are picturesque and elaborate. The instruments are ar-

ranged in rows, and called upon to deliver their valedictory speeches. Each one responds to the word of command like a member of a well-trained gymnasium class. Currents of different intensity are sent through six instruments simultaneously, and the hand on the dial of each must indicate the degree of the current with mathematical accuracy.

But the most important department of the whole laboratory—its holy of holies—is the standardizing room. Here are small cabinets, easily carried by hand, and worth hundreds of dollars apiece. From Cambridge, England, comes an automatic recorder which measures with absolute exactitude any quantity from a microbe to a monolith—from the millionth part of an ohm to a million amperes. From Berlin, Germany, comes a potentiometer, or power measurer, which keeps all the testing instruments in the laboratory up to the mark. This fine instrument is so delicate that it can only be used under certain conditions of temperature and atmospheric pressure. To keep it in perfect condition, any moisture in the air of the room is frozen out by means of a system of brine circulation pipes, and the room is afterward heated to the required degree with electrical heaters.

The laboratory possesses in its engine room a remarkable piece of mechanism, which, although extremely costly, would be entirely useless for any other conditions. It is often necessary, for testing purposes, to have different kinds of current—direct alternating, single or polyphase—and the current usually available for power purposes is alternating current rated at 6,600 volts. To "step" such a current up or down to different pressures would need in the ordinary way a separate motor dynamo for each different degree; but a pair of alternators has been devised, from which any kind of current can be obtained. The extraordinary feature of this ingenious set is that one alternator can be arranged to furnish volts (or electrical pressure), and the other amperes (or current) and subsequently the volts and the amperes can be sent through the same electrical circuit in any desired degree of combination.

## Fish Live Without Water.

A German scientist has discovered a way to keep fish alive out of water. He places them on a damp cloth under a glass case and supplies pure oxygen to them. The oxygen is first passed through a jar of water where it becomes somewhat moist and the damp cloth keeps the gills of the fish moist. The oxygen, says the scientist, passes through the wet gills of the fish and into their blood as it does when they are in the water, and the carbonic gas from their lungs goes off with the excess oxygen through a case. The fish can be seen to move their gills just as if they were in water, and when thrown into their native element seem as sprightly as ever. If this method is found to work under all circumstances, fish may be shipped in special cars for long distances without the use of water.

## Matter May be Electricity.

A John Hopkins professor, Dr. H. C. Jones, in a new work on the alleged electrical nature of matter, says that the line separating matter from electricity is on the point of disappearing. The corpuscle, he says, is nothing but a disembodied electrical charge, and contains nothing material. Instead of speaking of the corpuscle, he adds, we should speak of the electron.

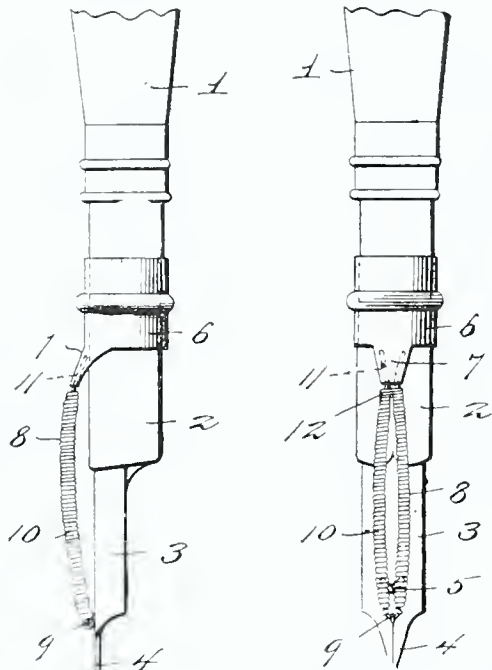


## CLEVER NEW PATENTS.

**A Quick-Action Wrench.—Fountain Attachment for Pens.—Combined Bag Holder and Truck.—Nail-Feeding Machine.**

### A Quick-Action Wrench.

Mr. Rollin Burnham, of Storm Lake, Iowa, has patented a quick-action wrench of simple construction. One of the proposed ways of manufacturing it is illustrated in the accompanying cut. It will be observed that a shank 1 is employed, having spaced side members 3 and 4 that are provided upon their inner faces with teeth. A jaw 7 is secured to the free ends of the members, while a slidable jaw 8 has openings that receive the shank members. This jaw is transversely pierced by a slot that is located between the openings, and intersects the same to expose the toothed portions of the members. An endwise slidable wedge 12 operates in the slot and its opposite faces, at the larger end, are longitudinally toothed, as shown at 15, so that they will interlock

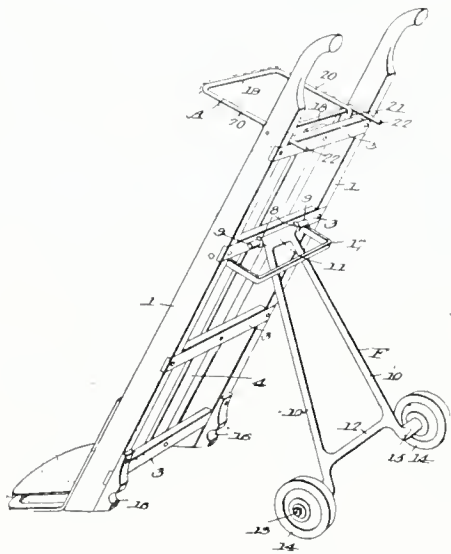


The attachment is shown in the accompanying illustration, applied to an ordinary pen holder having a writing point or nib of the usual construction. It consists of a carrier 6 in the form of a split spring metal sleeve adapted to embrace the pen holder and having a forwardly projecting socket 7, constituting a seat for the rear end of the fountain member 8. The latter comprises a wire core 9, and an outer covering or wrapping of wire 10, spirally coiled upon the core.

It will be noted that the side portions of the member 8 are spaced apart, except at the ends, the front end lying in easy contact upon the pen, while the rear end is connected to the socket of the carrier 6. The fountain member takes up a supply of ink which is prevented from flowing too freely because of the coils of the wrapping 10, the said coils constituting baffles for retarding the flow of ink and preventing the fountain from bleeding.

### Combined Bag Holder and Truck.

A truck which may be converted into a bag holder is illustrated in the accompanying view. It is the invention of James F. Hatfield, of Tiffin, Ohio,



and deserves special mention. The general construction of the truck is similar to all trucks, and needs no particular description. To the rear of the truck is journaled a pair of

arms 9 which form a part of the swinging wheel carrying frame F, the latter having the usual truck wheels 14, mounted on spindles 13. Half boxes or bearings 16 are secured to the side pieces of the truck frame to receive the spindles when the truck frame is lowered, as is the case when the truck is used for general purposes. A bail 17 is attached to the truck frame and serves to limit the outward movement of the wheel-carrying frame. As shown, the truck frame is supported by the wheel-carrying frame in an inclined position, and when in this

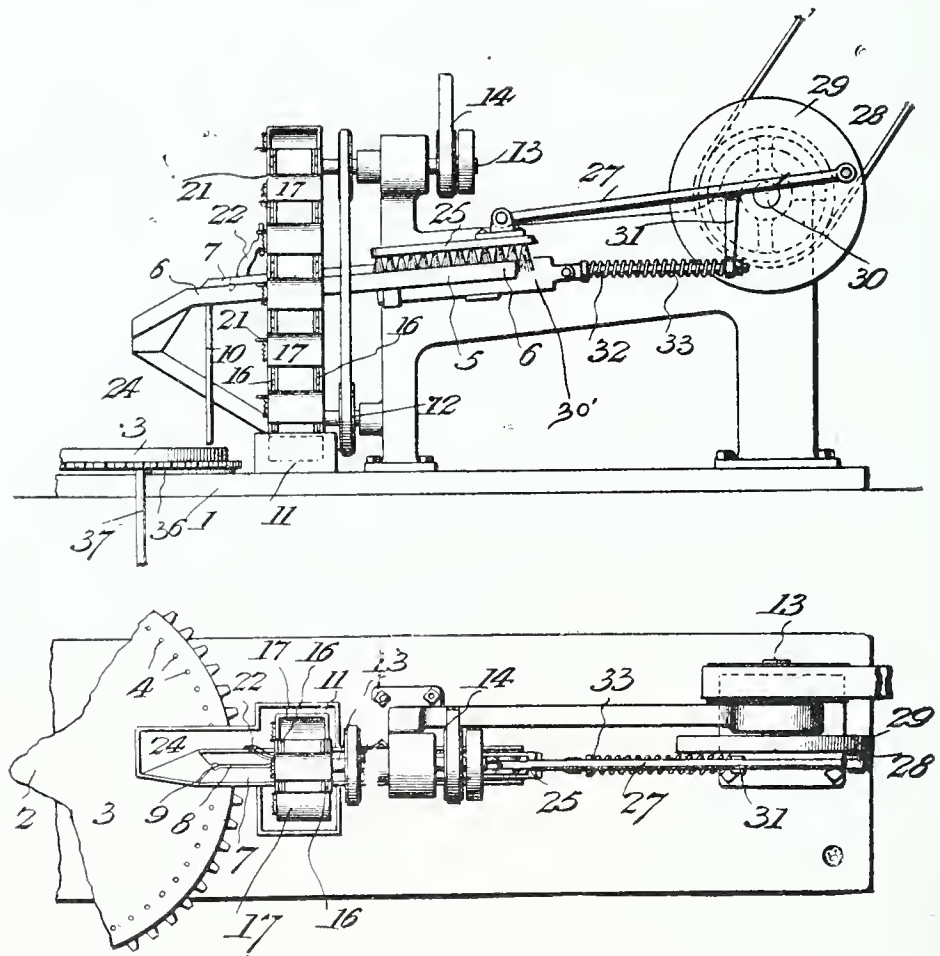
position is adapted for use in filling bags.

A bag holding attachment A is secured to the truck frame near the handles, and comprises a wire frame having prongs 22 to engage the bag. When the truck is in use for carrying purposes, the frame A may be folded out of the way.

This invention is of great practical utility, being especially adapted for use upon rough and uneven ground, where it may be conveniently set up for bag filling purposes, such for instance, as gathering potatoes in the field.

### Nail-Feeding Machine.

William Wolfe, of Batavia, Ohio, has patented an ingenious nail-feeding mechanism, by means of which nails fed in bulk will be delivered in proper position to a driving device of any appropriate character. A suitable supporting frame is employed having a lower bin 11, into which the nails are dumped. From this bin extends a nail elevator 17 that delivers to a peculiarly shaped trough 5, having a slot 8 therein. A reciprocating brush 25 operates in the trough, and is driven by any suitable means, while a slide 30, in like manner, reciprocates in the slot. At the lower end of the slot is a vertical tube 10, which delivers to a horizontally disposed disk 3 having sockets 4 that receive the nails to be driven. In operation, the nails dumped into the hopper 11, are delivered by the elevator 17 into the trough, and certain of such nails



will fall into the slot 8, while the others which fail to enter the slot, are forced down the trough by the brush 25 and return into the hopper. The nails, however, which enter the slot, will hang in a vertical position, and be forced by the plate 30 to the tube 10. They will gravitate through this tube and drop into the sockets 4. The disk 3 delivers them to driving mechanism of any desired character.

### Fountain Attachment for Pens.

A fountain attachment for dipping pens has long been sought after, and the invention of Marion E. McMaster of Monroe City, Missouri, which has been patented and the patent assigned to Henry B. Dines and Hover D.

## PATENTS, CAVEATS, TRADE-MARKS, COPYRIGHTS, AND DESIGNS. TWENTY-FIVE YEARS PRACTICE.

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## LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

WARREN FEATHERBONE CO. v. AMERICAN FEATHERBONE CO. et al.

(Circuit Court of Appeals, Seventh Circuit, 141 F. R. p. 513.)

### 1. TRADE-MARKS—NAME GIVEN TO PATENTED ARTICLE—"FEATHERBONE."

The patentee of a new product used as a substitute for whalebone, and made from the quills of feathers, gave the same in the specification the generic name of "Featherbone," by which name it was referred to by him in subsequent patents and became generally known; the word being so defined subsequently in dictionaries, both American and foreign, and used in foreign tariff laws, etc. Held, that on the expiration of the original patent the public had the right, not only to make the article, but to sell it by the name "Featherbone," and that such name could not be monopolized by the patentee as a trade-mark of his own manufacture.

### 2. SAME—UNFAIR COMPETITION.

Evidence held not to establish unfair competition by a defendant which engaged in the manufacture and sale of featherbone after the patent thereon expired, as against the owner of the patent, which had previously been the sole manufacturer, merely because defendant used the name "Featherbone," to which it had the right, and the articles themselves from their character were not distinguishable; there having been no attempt to imitate the dress or labels of complainant.

AMERICAN FEATHERBONE CO. v. WARREN FEATHERBONE CO.

(Circuit Court of Appeals, Seventh Circuit, 141 F. R. p. 655.)

### PATENTS—PRIOR PUBLIC USE—FEATHERBONE.

The Warren and Holden patent, No. 559,827, for a process of manufacturing featherbone, and the resulting product, while disclosing invention of a meritorious character, is void for prior public and commercial use of the invention by the patentees for more than two years before the filing of the application.

PELTON WATER WHEEL CO. v. ABNER DOBLE CO.

(Circuit Court, N. D. California, 141 F. R. p. 661.)

### PATENTS—INFRINGEMENT—WATER-WHEEL CASING.

The Krase patent, No. 633,962, for a water wheel casing, the main feature of the invention being a disk upon the shaft and revolving with it for the purpose of preventing water splashed upon the shaft from working into the bearings, makes a side chamber or pocket in which the disk revolves an essential element of the combination, and must be limited to the details of construction shown. As so construed, it is not infringed by the device of the Doble patents, Nos. 619,148 and 619,149, which has a circular disk used for the same purpose, but which is placed in the main casing, instead of in a separate chamber.

INTERNATIONAL POSTAL SUPPLY CO. OF NEW YORK v. AMERICAN POSTAL MACHINES CO.

(Circuit Court, D. Massachusetts, 141 F. R. p. 969.)

### PATENTS—INFRINGEMENT—STAMP-CANCELING MACHINE.

The Hey & Laass patent, No. 341,380, the Laass & Hey patent, No. 385,366, and the Hey patent, No. 632,527, all for stamp-canceling machines of the type in which the letter actuates the printing mechanism, construed, and held not infringed.

LOUDEN MACHINERY CO. v. JANESVILLE HAY TOOL CO. et al. LOUDEN MACHINERY CO. et al. v. SAME.

(Circuit Court, W. D. Wisconsin, 141 F. R. p. 975.)

### 1. PATENTS—INVENTION—NEW COMBINATION OF OLD ELEMENTS.

Where a new organization of old elements produces a new mode of operation and a beneficial result, there may be patentable

invention, whether that result be new or old.

### 2. SAME—INFRINGEMENT—HAY-SLINGS.

The Loudon patent, No. 444,546, for a hay-sling, while for a combination of old elements and not entitled to a broad construction, produces by a new combination a new mode of operation and a better result, and discloses patentable invention; also held infringed.

### 3. SAME—INVENTION.

The Loudon patent, No. 539,524, for a hay-sling, is void for lack of patentable invention.

### 4. SAME—PULLEY.

The Toney patent, No. 393,941, for a pulley having a detachable head so that different forms of heads can be used interchangeably to fit different hay carriers, is void for lack of invention, in view of the prior art which contained pulleys precisely the same in operation and effect and having the same elements except the removability of the head.

### 5. SAME.

The Loudon patent, No. 434,544, for a hay-carrier elevating pulley, was not anticipated and discloses invention, being for a new combination of old elements co-acting to produce a new and useful result; also held infringed.

### 6. SAME—HAY-CARRIER APPARATUS.

The Loudon patents, Nos. 493,216 and 526,839, both for track hangers for hay-carriers, show only combinations of old elements each of which performs its old functions, and are void for lack of invention.

### 7. SAME—STOP DEVICE FOR HAY-CARRIERS.

The Burkholder patent, No. 490,738, for an adjustable stop device for hay-carriers, is limited as to all of its claims to a device having extending wings as shown in the specification and drawings. As so construed, held not infringed.

BENJAMIN ELECTRIC MFG. CO. v. DALE CO. et al.

(Circuit Court, S. D. New York, 141 F. R. p. 989.)

### PATENTS—INFRINGEMENT—CLUSTER LIGHTS.

The Benjamin patents, Nos. 721,744 and 721,777, granted on a divisional application and both relating to a cluster of electric lights, in which the electricity is conveyed to the lamps through plates instead of by a separate wire to each, disclose sufficient mechanical improvement over prior structures to constitute patentable invention, although not novel in their electrical features. As so construed, held not infringed by a structure mechanically, but not electrically, different from those of the patents.

MELLOR v. CARROLL et al.

(Circuit Court, D. Massachusetts, 141 F. R. p. 992.)

### 1. PATENTS—SUIT FOR INFRINGEMENT—PRIVITY OF ESTOPPEL WITH ASSIGNOR.

If the assignor of a patent, who is estopped to deny its validity, enters into business with others, and all, availing themselves of his knowledge of the patented process or machine, enter upon a manufacture infringing the patent, all are bound by his estoppel when sued for infringement; and when individuals so estopped form a corporation to carry on the infringing manufacture, the corporation is also deemed in privity of estoppel with them, even though it has some stockholder who is more or less ignorant of the history of the patent and of the transactions which led to the incorporation.

### 2. SAME—INFRINGEMENT.

The Carroll patent, No. 475,929, for a non-metallic bearing, held infringed on motion for a preliminary injunction in a suit by the assignee against the patentee and others.

WESTERN TELEPHONE MFG. CO. v. AMERICAN ELECTRIC CO. et al.

(Circuit Court, N. D. Illinois, 141 F. R. p. 998.)

### PATENTS—SUPPLEMENTAL BILL FOR INFRINGEMENT—SUCCESSOR OF DEFENDANT.

Pending a suit for infringement of a patent by an article made under a later patent, the defendant sold its business, property, and good will to another corporation, which took an assignment of the license under which the alleged infringing article was made, and continued its manufacture and sale, afterwards obtaining a new license by which it contracted to make and sell the article during the life of such license. Held, that the purchaser assumed such relation to the subject-matter in suit that, after decree finding infringement, it might be brought in by supplemental bill and subjected to the injunction granted thereby,

and to liability for damages under such decree as to acts of infringement committed by it subsequent to its purchase.

GENERAL ELECTRIC CO. v. GARRETT COAL CO.

(Circuit Court, W. D. Pennsylvania, 141 F. R. p. 994.)

### PATENTS—INFRINGEMENT—REGULATOR FOR ELECTRICAL DRIVEN MACHINERY.

The Knight and Potter patents, Nos. 587,441 and 587,442, one for a method of regulating electrically driven machinery, and the other for an apparatus for applying such method, are not infringed by an apparatus in which a dead resistance is continuously used in changing the connection between the two motors used from series to multiple, whereas in the method and apparatus of the patents it is entirely cut out at one stage of the transition.

LANE BROS. CO. v. WILCOX MFG. CO. et al.

(Circuit Court, S. D. New York, 141 F. R. p. 1000.)

### PATENTS—INVENTION—DOOR HANGERS.

The Lane patents, No. 422,305, for a wheel for door hangers, and No. 426,390, for a door hanger, are void for lack of patentable invention, and the latter also for anticipation.

BIBB MFG. CO. v. BOWERS.

(Circuit Court of Appeals, Fifth Circuit, 142 F. R. p. 137.)

### PATENT—INFRINGEMENT—STOP MECHANISM FOR WINDING MACHINE.

The Bowers patent, No. 727,888, for a weight stop motion adapted for use in twine winding spindles, does not cover a pioneer invention, in view of the prior art, and must be construed in matters of infringement in accordance with the rules applicable to ordinary combination patents. As so construed, held not infringed by the machine of the Worrill patent, No. 736,809, which does not contain all the elements of the Bowers combination.

AMERICAN CAN CO. v. HICKMOTT AS-  
PARAGUS CANNING CO. et al.

(Circuit Court of Appeals, Ninth Circuit, 142 F. R. p. 141.)

### 1. PATENTS—INFRINGEMENT—CAN-BODY MAKING MACHINE.

The Jordan patent, No. 436,792, for a can-body making machine, while not a pioneer patent in the sense of describing the first machine for making can bodies, covers the first in which a rotary horn was used for bending and clamping the sheet from which the can is made, and the invention constituted a highly meritorious improvement which marked a distinct advance in the art, and entitles the patent to the protection of the doctrine of equivalency in proportion to such advance. As so construed, claims 64 and 69 are infringed by the machine of the Eldridge patent, No. 712,998.

### 2. SAME—CONSTRUCTION OF CLAIMS.

The words "substantially as specified," at the end of the claim for a combination, refer to the whole claim, and import nothing into it not already there, either to narrow it so as to escape anticipation, or to broaden it so as to establish infringement.

### 3. SAME—INFRINGEMENT—CAN-BODY MACHINE.

The Hoiden and Brown patent, No. 598,567, for a can-body machine, held not infringed by the machine of the Eldridge patent, No. 712,998.

SIPP ELECTRIC & MACHINE CO. v. ATWOOD-MORRISON CO.

(Circuit Court of Appeals, Third Circuit, 142 F. R. p. 149.)

### 1. PATENTS—PRIOR USE—EVIDENCE TO ESTABLISH.

There is no hard and fast rule as to the measure or kind of proof required to establish prior use of a patented device, further than that it must be clear and satisfactory to the judicial mind in each case.

### 2. SAME—SWIFT BRACKET FOR WINDING MACHINES.

The Morrison patent, No. 729,084, for an improvement in brackets for supporting swifts or reels in a winding machine, which consists in making the bracket adjustable by uniting the arm to the base by a pivot and clamp, is void for anticipation, prior use, and lack of patentable invention.

NATIONAL PHONOGRAPH CO.

LAMBERT CO.

(Circuit Court of Appeals, Seventh Circuit, 142 F. R. p. 164.)

### 1. PATENTS—PRIOR PUBLIC USE—LENGTH OF USE.

The use of a process by the patentee and his employes for more than nine years before application was filed for the patent, without any substantial change therein, during which time some 8,000 articles were produced for commercial purposes, cannot be considered experimental, although it is claimed that improvement was constantly sought, but is a public use which invalidates the patent.

### 2. SAME—PROCESS OF DUPLICATING PHONOGRAMS.

The Edison patent, No. 713,209, for a process of duplicating phonograms, is void for prior public use of the invention.

SIEMENS-HALSKE ELECTRIC CO. v. DUNCAN ELECTRIC MFG. CO. et al.

(Circuit Court of Appeals, Seventh Circuit, 142 F. R. p. 157.)

### 1. PATENTS—INFRINGEMENT BY PATENTEE—ESTOPPEL BY ASSIGNMENT.

An assignment of a patent by the patentee estops him, not only to deny the validity of the patent, but also to invoke the prior art as a limitation of its claims as made and allowed. In a suit against him for infringement by the assignee, extraneous evidence is inadmissible, if there is no ambiguity or uncertainty in the language of the description and claims; and if there is uncertainty, outside evidence is admissible only to make clear what the applicant meant to claim and the government to allow, and not for the purpose of showing, even in the slightest degree, that the applicant had no right to claim, and that the government was improvident in allowing, what was in fact claimed and allowed.

### 2. SAME—CORPORATION ORGANIZED BY PATENTEE.

A corporation organized by a patentee, who had assigned his patents, and others having full knowledge of the facts, who are largely the owners of its stock, is estopped to deny the validity of the patents, or to limit their claims by the prior art, to the same extent as the patentee.

E. REGENSBURG & SONS v. JUAN F. PORTUONDO CIGAR MFG. CO.

(Circuit Court of Appeals, Third Circuit, 142 F. R. p. 160.)

### 1. PATENTS—NOVELTY—CIGAR BAND.

The Regensburg patent, No. 715,512, for a cigar band having one end wider than the other to facilitate its application to the cigar and to prevent the narrow end, which is pasted over the other, from adhering to the wrapper, is void for lack of novelty, in view of the prior art.

### 2. TRADE-MARKS—VALIDITY—CIGAR WRAPPER.

There cannot be a valid trade-mark in a cigar wrapper, the only characteristics of which are that it is wider at one end than the other and that it is of a brown color with white lettering thereon.

### 3. SAME—UNFAIR COMPETITION.

Unfair competition cannot be predicated upon the use by defendant of a plain brown cigar band with white lettering thereon, because it is similar in color and shape to one previously in use by complainant, where there is no evidence of an intention to imitate, and the only characteristic thing about either band is the name thereon, in which the two are dissimilar, both in the name and style of lettering.

ROBINSON v. AMERICAN CAR & FOUNDRY CO. et al.

(Circuit Court, N. D. Illinois, 142 F. R. p. 170.)

### 1. JUDGMENTS—RES JUDICATA—DECREE WITHOUT PREJUDICE.

A judgment or decree without prejudice never works an estoppel or adjudicates the res.

### 2. SAME—SCOPE OF ADJUDICATION—HEARING ON BILL AND ANSWER.

In a suit in equity for infringement of a patent which was submitted on the pleadings, consisting of the bill and an answer, which denied that complainant was the inventor of a device of the patent, a decree sustaining the sufficiency of the answer and dismissing the bill is a conclusive adjudication of such issue, and is a bar to a second suit for infringement of such patent between the same parties.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Helge Westergaard, inventor: N. D. Smith, assignee, Austin, Texas. Ice Conveying Apparatus.—This invention is an efficient apparatus for conveying ice cans from the freezing tank to the dump in an ice making plant, and for returning the empty cans to the tank without the least possible expenditure of energy and without necessity for the employment of the complicated cranes and trucks usually installed for this purpose. The apparatus comprises timbers located above the side walls of the freezing tanks, and supporting a traveling boom. Along the under side of the boom is extended a winch rail which slidably supports a winch frame which may be quickly shifted to position. The winch carried by this frame is provided with operating cranks, and with suitable dogging mechanism, and an elevating chain is wound thereon and provided with the usual hook. In addition to the adjustable winch, the boom is equipped with a wheeled truck provided with a hanger having grappling mechanism designed to effect the transfer of an ice can from the hoisting mechanism to the truck for conveyance to the ice dump. This grappling mechanism includes a lever fulcrumed on the hanger and formed with a loop, the opposite ends of which are adapted to engage opposite sides of the hanger to limit the movement of the lever in opposite directions. A hook is suspended from one end of a lever and a catch is pivoted on the hanger above its lower end to engage the extremity of the lever to which the hook is connected and to thereby retain the hook in its elevated position.

George S. Ramsay, St. Marys, Pa. Coke Ovens. Three patents.—Two of these inventions mark important improvements in coke ovens and a decided advance in the art of manufacturing coke. Prior to Mr. Ramsay's inventions, coke ovens were of two types, one the ordinary bee hive oven, and the other forming a retort and provided with means for saving the by-products. The first type of coke ovens, which has been very generally used, has no means of applying heat to the bottom of the oven, and the coking process, which starts from the top of the charge, extends downward to within 6 or 7 inches of the bottom of the oven, thereby leaving large black butts and inferior coke at the bottom. Mr. Ramsay has improved this type of oven by providing means for applying heat to the bottom of the oven, so that the coking process will commence at the bottom as well as at the top, whereby the entire charge of the coke will be rendered pure, and the butts and inferior coke, usually present in this class of ovens, entirely eliminated. The coke oven embodies a charging opening at the top, a door in front for withdrawing the coke, a stack located in rear of the oven, a main flue located centrally below the floor of the oven with its front end piercing the front of the oven wall, and its rear end in communication with the stack, a damper door for the front of the flue, substantially radial flues at opposite sides of, and in communication with, the main flue to permit the products of combustion to pass directly to the stack, other radial flues terminating short of the main flue, transverse flues connecting the radial flues and communicating with the main flue, and independent upstanding flues upon the exterior of the oven wall with their inner ends piercing the same for communication with the interior oven, and their lower ends communicating with the flues beneath the floor. One of

the essential features to the success of the oven is the floor, having a gas-excluding packing, composed of fibrous material and granular material, such as sand, which is supported by the fibrous material, whereby the granular material is prevented from sifting through the floor.

The second patent provides a floor structure or floor supporting structure for the gas-excluding packing to prevent any liability of the latter accidentally breaking or collapsing under the weight of large charge, and thereby permitting the gases or other products of combustion to re-enter the oven and consume the charge. Also in this patent the up-standing flues are connected with the main flue at the bottom of the oven by means of independent connecting bottom flues to enable the floor of the oven to be uniformly heated in a positive and effective manner, and also to permit any one of the up-standing flues to be cut out if desired. The independent front and rear bottom flues are of unequal length, the rear front flue being shorter than the rear bottom flue. Each bottom flue consists of a short outer radial portion, an intermediate U-shaped portion or loop and a short inner transverse portion. The interposed walls between the bottom flues are continuous and are connected with the walls of the oven to provide continuous supports for the floor.

The third patent relates to a coal washer, which separates sulphur, slate, rock, bone and other heavy impurities from the coal, and delivers the clean coal into a bin or other receptacle. It is provided with a sluiceway, which will not be corroded or otherwise injured by the sulphur or other impurities contained in the coal, means are provided for clarifying the portion of the sluiceway for exposing the material to view. The coal washer comprises a sluiceway, an endless belt or belts, and scrapers carried by the endless belt or belts and composed of a body portion, and an inclined strip of yieldable material arranged on the front face of the body portion, and inclined backwardly from the direction of the advance of the scrapers, and having its edge engaging the bottom of the sluiceway. The sluiceway is provided with a glass bottom lining, presenting a smooth surface to the yieldable scrapers, which, when the glass bottom is wet, adhere to the latter and scrapes the bottom perfectly clean, so that none of the impurities pass beneath the scrapers. The water is supplied to the sluiceway through pipes of different diameters, the larger pipes being adapted to discharge water, which has been used, and a smaller pipe being arranged at the upper portion of the sluiceway, and discharging clear water to expose to view the material carried by the scrapers.

Bradbury Hill, Osage, Iowa. Copy Holder. Two patents.—The copy holder of the first patent is designed for large books to enable accurate copies and extracts to be made, and it is adapted to conform to the configuration of and lie flat against a book, in which the leaves round up or bulge at the center. It comprises a guide rod provided with means for engaging one edge of a book, an adjustable bar mounted on the guide rod and having means for engaging the opposite edges of the book, and an adjustable indicator having weighted hinged sections adapted to lie closely against the leaves of the book. The indicator is provided with anti-friction rollers to enable it to slide freely over a book, and it is secured in its adjustment by a pair of spring-actuated clamp levers arranged to engage the guide rod.

The second patent was issued to Bradbury Hill, Thos. N. Shambaugh, and Lauritz A. Larson, all of Osage, Iowa. The device of this patent is an improvement on the first. It is provided with adjustable book engaging means having terminal clamps for en-

gaging the covers of the book, and provided with a central clamp having projecting jaws for holding the guide rod. The jaws are provided with a plurality of seats, which permit the guide rod to be adjusted to suit the thickness of a book. The indicator, which is slidable on the guide rod, is extensible to fit books of different sizes.

William W. Woods, Springfield, Mo. Heater. Three patents.—The heater of the first patent is constructed of sheet metal and has an inclined radiating surface. It is adapted to provide a side draft to the chimney when starting a fire, and is capable, after the fire has been started, of causing the products of combustion to pursue a circuitous course through the heater to increase the heating effect thereof, and obtain a maximum heating effect from a given amount of fuel. The heater embodies an outer shell provided at the ends with upright flues, one of the flues having an inlet at the top and communicating at the bottom with the interior of the heater, and the other flue being provided at the top with an outlet. An inner shell forms a transverse flue, and a partition arranged within the inner shell provides a bottom flue located between the combustion chamber and the lower portion of the transverse flue, and having an inlet at one end and communicating at the other end with the upright flue, which has an outlet at the top. The bottom flue is adapted to protect the fire pot or combustion chamber, and it enables the same to heat the cold air as the latter enters the stove, and it prevents the base of the stove from becoming excessively heated.

The second patent also relates to a sheet metal heater, and means are provided for passing air through the same at the bottom walls of the fire pot, whereby such air is highly heated and the walls and linings prevented from burning out. The heater is composed of an outer shell provided at its ends with upright flues, having outlet apertures at the top of the heater communicating with the exterior, an inner shell forming a transverse flue, side and bottom linings spaced from the sides and bottom of the inner shell to form side and bottom flues, which communicate at their ends with the upright flues, and an inlet communicating with the bottom flue and with the exterior of the stove at the bottom thereof.

The third is a design patent covering an ornamental stove. A highly ornamented base is employed, on which is located a downwardly tapered sheet metal body having a rounded top. The various trimmings and parts of the stove are ornamented to conform to the ornamentation of the base. As a result, a highly artistic and attractive stove is produced.

William M. Viser, Louisville, Ky. Flour Sifter. Two patents.—The first patent comprises a body provided with handle brackets, a sieve, a rotatable handle mounted between the brackets and provided with a crank arm, and an agitator co-operating with the sieve and provided with a stem projecting outwardly through an opening of the body and located below the handle, the said stem being fulcrumed on the body and connected with the crank arm of the handle. The handle requires but a slight movement to impart a quick, positive swing to the agitator.

The flour sifter of the second patent consists of a body, a sieve, an agitator mounted within the body and provided with a projecting loop, a handle mounted on the exterior of the body and having a longitudinal bore, and a shaft provided with a corrugated or bent portion, passing through the bore of the handle and frictionally engaging the latter. The shaft also has an arm, extending into the top of the body and connected with the loop of the agitator. The agitator is com-

posed of a plurality of curved wires, spaced apart at their intermediate portions and having their end portions twisted together to form journals.

Walter E. Snodgrass, Hull, Ill. Wagon Standard.—The present invention is adapted, should wagon beds, racks, loads of lumber, wood, etc., become loose, to enable the same to be readily clamped and securely held on the running gear. The device embodies a standard having threaded openings, a vertical clamping plate arranged at the inner face of the standard, and adjusted screws mounted in the threaded openings of the standard and extending entirely through the same. The inner ends of the adjusting screws are swiveled to the clamping plate to support the latter, and they are adapted to positively force the clamping plate inwardly into engagement with a body, rack or load.

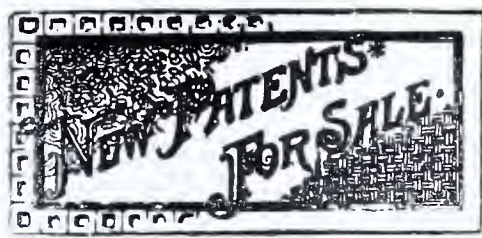
James E. Gibbs, Clifton Forge, Va. Four patents.—The first patent relates to an end gate, having adjustable fastening means adapted to facilitate the opening and closing of the end gate, and capable of securely locking the same in its closed position, and also holding the end gate either partially or entirely open. The end gate fastener comprises a keeper, an arcuate pivoted latch provided at its concave side with ratchet teeth for engagement with the keeper, and also provided with a seat on its convex side, and means to hold the ratchet teeth of the latch in engagement with the keeper, and for permitting a free movement of the latch across the keeper, and also for engaging the seat to prevent entire disengagement of the latch from the keeper.

The second patent, an interest in which has been assigned to Wm. A. Byerly and E. K. Miller of Bridgewater, Va., covers a sash fastener comprising a rack, a casing having an opening and provided at opposite sides thereof with inclined edges, a gear wheel meshing with the rack and capable of securing an outward movement, a locking device arranged to engage the gear wheel, and a catch pivotally connected with the locking device and operating in the slot or opening of the casing and provided with shoulders arranged to be turned into and out of engagement with the inclined edges.

The third patent, which has been assigned to John R. Allen, Beecher Laswell and I. W. Kennett, of Lexington, Ky., also relates to a sash fastener, adapted to mutually interlock the upper and lower sashes, and also fasten the same to the window frame or casing, whereby the sashes may be effectually locked at various adjustments. The sash lock embodies a pair of angularly disposed bolts, one of which is cut away upon its under face, and is provided with a cam portion, and the other being cut away upon its upper face, with the reduced portion working transversely within the cut-away portion of the first mentioned bolt, and having a shoulder for frictional engagement with the cam portion. The bolts are operated by a pair of bell crank levers.

The fourth patent covers a sash fastener, having a locking mechanism concealed within the window frame or casing, and capable of enabling the sashes to be opened slightly at both the top and bottom, and of automatically locking the same against movement in either direction, should an attempt be made to open either or both sashes. The sash fastener comprises a plate having opposite housings, reciprocating bolts operating in the housings, springs located within the housings and engaging the bolts, a connecting piece for the bolts, a cam-mounted on the plate between the housings for engaging the connecting piece, and an operating shaft connected with the cam.





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**FOR SALE**—U. S. and Canadian Patent No. 821,349, dated May 22, 1906. Combination Furniture, between bed and table. The invention is new and useful, especially for hotels, lodging houses, camps, and houses of small space. It has for its object to provide a folding structure which can be easily used as a bed or folded to be used as a table. Another object of this invention is to be easily removed on steps or through small doors, because it can be folded together with the benefit of moving one piece instead of two, and saving the expenses of the buyer of buying two pieces. This invention is extremely simple in its construction, strong and durable, and comparatively inexpensive to manufacture. Copy of patent sent if wanted. Address, John Fedran, East Pittsburgh, Pa. oct

**FOR SALE**—Patent No. 809,905, dated January 9, 1906, also Canadian patent. Overshoe fastener for fastening overshoes to prevent slipping off the heel of shoe. For further information apply to inventor, W. O. Brockway, 8445 Union Avenue, Chicago, Ill. sep

**FOR SALE**—A new and useful device for brush cutting. Has two knives. Cuts close to the ground; will last a life time. Easy to operate. Big profit for the maker. Address, F. X. Vallee, Oxford Center, Sherbrooke, Co., Quebec, Canada. sep

**FOR SALE**—Patent No. 783,897, dated Feb. 28, 1905. Plumb and Spirit Level. Address, R. M. Walton, Onaway, Michigan. sep

**FOR SALE**—Patent No. 816,490, dated March 27, 1906. Curtain Pole, without rings or pins. Best thing of the kind ever invented. A money maker for the manufacturer. Address, James N. Mills, Box 16, Oak Station, Pennsylvania. sep

**FOR SALE** S. U. Patent No. 815,253 dated March 13, 1906. Clothes Line and Pin. A bargain for some one, 80 per cent profit. For further information address patentee John W. Baker, R. D. No. 1, Halls, Lauderdale, Co., Tenn. sep

**FOR SALE**—Patent No. 815,084. Pawl and Ratchet. The invention is a ratchet drill wheel with a pawl on each side of the wheel, connected to the same lever. Address, J. S. Fletcher, Mound City, Kansas. sep

**FOR SALE**—U. S. Patent. Will sell at sight in hotels, barber shops, dwellings and public institutions. Apply to Doyle & Lusty, West Lorne, Ontario, Canada. sep

**FOR SALE**—Patent No. 783,468, dated Feb. 28, 1905. Rotary Turbine Motor. Capital wanted to organize a company for manufacturing. Present capital too small. Address, Adelbert Sauer, 5115 Rosetta Street, Pittsburg, Pa. sep

**FOR SALE**—U. S. Patent No. 816,129, issued March 27, 1906. Coupling device. Can be easily uncoupled when full draught of engine is being exerted. Great advantage over other makes. Very simple; only three working parts. Will take cash or machinery. Address, A. E. Scouten, Riding Mountain, Man., Canada. sep

**FOR SALE**—Patent No. 815,805, dated March 20, 1906. Hand stamping machine operated by twenty-eight steel discs. The greatest office necessity of the age. Upon a royalty plan, or a responsible firm to manufacture. Address, Irving Eyer, P. O. Drawer 293, Wilmington, Del. sep

**FOR SALE**—Patent No. 809,135, dated Jan. 2, 1906. Pencil Holder. Will hold pencil or fountain pen in vest pocket without injuring the fabric. Invention patented in Canada and England. Made of one piece of wire. Address, Isaac C. Reesor, P. O. Box 474, Pueblo, Col. sep

**FOR SALE**—Patent No. 816,955. A valuable, novel, ingenious combination and necessary household article to prepare the daily meals. A meat bruiser, tenderer, chopper, and vegetable chopper and scraper. Address, F. Beuckman, 807 St. Louis Ave., East St. Louis, Illinois. sep

**FOR SALE**—Patent No. 808,969. Fence Post. Will sell outright cheap. Make me an offer. Post beats anything yet invented. Requires no wire stretcher. Address, M. L. Boyce, Carroll, Iowa. sep

**FOR SALE**—Self-Oiler for all kinds of vehicle wheels. Will sell outright, on royalty, or state rights. Partner wanted with capital to develop same. For full particulars address, A. E. Wilcox, Box 520, Millville, Mass. sep

**FOR SALE**—U. S. Patent No. 814,527. Bird Trap. Adjustable to catch all kinds of birds from large birds to sparrows. Perfectly harmless. Any bird can be released without injury. Made for fifty cents, will sell for \$2.50. Address, Edgar L. Flint, East Hiram, Maine. sep

**FOR SALE**—Patent No. 726,610. Bicycle Canopy; or will exchange for some machinery, tools, etc. Send for circular. Address, Martin Zech, Prairie du Sac, Wis. sep

**FOR SALE** outright or on royalty—Patent No. 775,482. Invalid's perfect prop and bed table. Cheapest, lightest, best made. Nursing mothers need it. Invaluable to bedfasts. Address, Laura R. White, Ashland, Ky. sep

**FOR SALE**—U. S. Patent No. 812,014. A simple and inexpensive stacker, made of woven wire, for holding a stack of bundles of grain in proper shape while the stack is being built. When stack is completed, frame is taken off. Works fine. Address, John H. Bullock, Millerton, Kans. sep

**FOR SALE**—Patent No. 774,693. Steering Apparatus for Ships, dated November 8, 1904; and patent No. 755,928. Heat Regulator, dated March 29, 1904. Address, John Peterson, Lake George, N. Y. sep

**FOR SALE**—U. S. Patent No. 812,982, dated February 20, 1906. Headlight Cover. Operates by air from the cab of a locomotive. Can be manufactured at small cost and is always reliable. Address, H. M. Davenport, Sheridan, Wyo. sep

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## Protecting Workmen.

As noted in the INVENTIVE AGE for July, the labor laws in Europe are much more stringent than in our country. Efforts are made to secure the workman from accident, and to protect him in the event of old age or infirmity. The fact that the employer is held liable for all injuries that the laborer incurs while in the pursuit of his occupation, makes his protection an important question, and causes the adoption of safety devices that are unknown in the United States. So widespread is the interest in this subject, that a permanent exhibition of practical appliances to prevent accidents to operators of machines in factories has been opened in at least one European city.

If such a law obtained in this country, it would have a most beneficial effect upon conditions in our workshops, and would stimulate invention along the lines of preventing casualties. Hundreds of useful devices for the protection of workmen have already been patented, but owing to the indifference of the authorities, have never been put to use in industrial establishments. It is not worth while, they argue, to go to the expense of installing such devices: let the workman run the risk. It is because of the lack of such paternal legislation that accidents are numerous in this land of the free—so numerous that the continental press contains frequent references to "the frightful carelessness in regard to human life in America." But to pass laws protecting workmen would be a Herculean task. We can readily imagine what a lobby would fight any effort to fix the responsibility for accidents on the employer. It is notorious that it required an act of Congress to compel railway companies to put automatic car couplings and automatic brake apparatus on the freight cars, although each day had borne a ghastly record of bodies crushed and mangled in the attempt to accomplish this work by hand. Other defects in the apparatus used in connection with railroads cause similar losses, but no effort is made to

prevent them. A Congressional committee was appointed some time ago to inquire as to the feasibility of requiring railroads to use the block signalling system, automatic switches, and other appliances to safeguard both passengers and railroad employees; but it will be many years before such legislation is made operative, for the railroad officials are a unit in their opposition to such measures. The struggle over the railroad rate bill is fresh in the minds of the people, and similar opposition would meet every "interference" with the freedom of these great corporations to conduct their business as they think convenient. The same attitude is characteristic of the heads of our great manufacturing concerns. It is easy to picture their horror if they were required to pension incapacitated workmen—as in France, for instance, where a laborer receiving permanent injuries is entitled to an annual income of two-thirds of his salary. For temporary injuries, he can claim one half during the period he is unable to perform his work. The protection extends even to his family. If a man dies as the result of an accident, his wife and children are entitled to a percentage of the salary which he was receiving. It is no wonder that French builders of machines make safety to the operator a prime consideration. It would be well for our labor unions to bend their energies toward effecting a passage of similar legislation on this side of the water.

## Modern Invention in Arctic Exploration.

The expeditions being fitted out in various countries for renewed attempts upon the North Pole will have at their command resources of science that promise to render their efforts more successful than were those of the past. The most sensational, of course, is the airship in which Walter Wellman will make his journey. In spite of the misfortune of Andree, much is expected of this form of locomotion. The great craft which will convey Mr. Wellman and his five companions will be the largest and most scientifically constructed vehicle of its kind ever built or even attempted. The balloon is 164 feet in length, and it will have a lifting power of 16,000 pounds. The car is 53 feet long, and the gasoline motors will propel the huge vessel at a speed of from 10 to 19 miles an hour. It is calculated that the flight to the pole may be made in 100 hours. This is a far superior equipment to that of Andree, whose balloon was unable to cope with the air currents, and was lost within a few hours after starting. The Wellman expedition will also employ wireless telegraphy—this agent, indeed, will be used by all the parties that are now engaging in polar exploration.

One of the most carefully planned expeditions that has received the special approval of Nansen and other authorities, is that of Mylius Erichsen, which leaves Denmark this summer. Greenland, as the most northerly land in the world, has been selected by the leader as a starting point. Automobiles and motor sledges will be re-

lied upon, instead of the dogs that require so much food to be transported for their sustenance. Aluminum will be largely used in the construction of these vehicles.

Motor boats will form another feature of modern equipment. Developments in this line of invention are rapid. As will be seen in another column of this edition, radical departures in the construction of motor boats may be made in the future, one of which would seem to be specially adapted for travel in the frozen zone. In any event, the history of twentieth century exploration of Arctics bids fair to be less of a record of disaster and failure than that of former generations.

## Speed on Water.

Sixty miles an hour on the water is the promise made for a new motor boat. Whether this speed is ever actually attained, it is certain that a great advance in locomotion has been realized, as the resistance of the water is avoided by lifting the boat out of it. At the request of the British Admiralty, some years ago, Froude followed lines of experiment involving the application to navigation of the children's pastime of "skipping" stones on ponds. The result is the production of a boat with two hulls, long and narrow, on the principle of a catamaran, which has been upsetting expert ideas. It has five planes placed horizontally beneath the hulls, which, when the power is applied and the boat moves forward, lift the boat clear of the water and "skip" the surface. Great power would naturally be required should the hulls of the boat, with the planes beneath, remain submerged; but the resistance of the water, on the same principle as the resistance of the air to the aeroplane, brings the planes to the surface and of course lifts the craft clear of the water.

It had already been found possible to shape hulls so that their speed of translation should tend to lift them partly out of the water. Thus, when the speed increased, the resistance of the water decreased in proportion on account of this lifting of the hull. Some constructors had thus succeeded in lifting about 33 per cent of the total displacement of the boat. A Frenchman, De Lambert, has carried this idea farther, and has constructed a boat which, in place of causing the emergence of about one-third of its hull from the water, succeeded in bringing the entire hull upon the surface. At this moment, the resistance to the boat's advance became sensibly null. De Lambert's motor boat has a length of 20 feet and with only a 12-horse power motor, attains a speed of 25 miles an hour. With a more powerful motor, a much higher rate may be reached. This boat has stood the test of practice and in defiance of theoretical objections, steers perfectly. It can be stopped with the greatest facility because, when the motor stops, the hulls fall back into the water and act as a brake. Other boats of this type are coming into use, and there is no reason why larger vessels should not be constructed on the same principle.

Another novelty in motor boats also involves the lifting of the craft out of the water, by the use of what might be called the air ball bearing. The vessel now being submitted to experiments is a mere box in shape, the bottom sloping upward at the forward end, forming a scow-shaped bow. On each side and amidships are fixed three stout keels. Between these are seven lighter plates of about half the depth of the keels, making seventeen in all, extending the full length of the bottom of the boat. Between the plates are a number of holes sloping aft, which are connected with an air compressor driven by a motor engine. The boat depends for propulsion on the reaction of the jets of air from their orifices, of which there are a large number, striking the water. At the same time the air is prevented by the plates from escaping at the sides of the boat, and thus, it is claimed, is formed a species of air bed between the water and the bottom of the boat, over which the craft will glide with much greater velocity than if it were propelled through the water. It is obvious that to sustain the weight of the boat the air bed would have to be under considerable pressure, which would mean the absorption of a large amount of power. But the inventor has already dealt successfully with other mechanical problems, and it may be that this new idea will be worked out satisfactorily.

## Gasoline Railway Motors.

Just as the steam locomotive reached what seemed to be perfection, the electric locomotive and the gasoline motor came along to challenge its supremacy. The president of the Master Car Builders Association, at the last annual convention, warned car builders that with the changes now going on, steam railway locomotives are destined to become obsolete before many years.

The Union Pacific has been experimenting with gasoline motor cars, and their success has been so pronounced that a special factory will be built to turn out these engines. These cars are made with reference to the safety and comfort of passengers. They are practically all steel and built almost like a boat, with light port-holes in place of ordinary windows, and a system of artificial ventilation. The car is built wedge-shaped and as free from friction as possible in order to minimize wind resistance.

A 6-cylinder gasoline engine of 100 horse power propels the car, and 40 miles an hour can be reached even sooner than with an electric car.

## Diamonds for Drawing Wire.

Diamonds are used as dies for drawing out wires of the smallest size. Steel will not answer for this purpose, as the wear is too great. Copper, silver and platinum are the metals generally drawn to the very small sizes. With diamond dies, platinum can be drawn to a diameter of 5-1000ths of an inch. An idea of the fineness of a copper wire drawn to 3-1000ths of an inch in diameter may be gathered from the fact that in one pound of the metal, there are six miles of such wire.



### Novel Ceramic Product.

A new earthenware product, lately introduced, is made by preparing a paste of finely pulverized feldspar, sand and lime, mixed in certain proportions and baked in an oven. Combined with water and worked into a plastic paste resembling sculptor's clay, these materials produce a porcelain or earthenware of great hardness and durability, which resists corrosion by acids, or alteration by atmospheric influence, is a poor conductor of heat or electricity, has a specific gravity of three and three tenths, and is in color a yellowish white, although this may be changed to any desired tint by the use of metallic oxides.

This substance has the qualities,—unusual in products of this class—of being not only hard but tough, so that it can be bored, cut, planed and polished. Its cheapness, ease of manufacture, and exceeding resistance to acids, moisture and other deteriorating influences are thought to specially adapt it for use as material for subterranean pipes and conduits for water, gas, chemicals, etc.

### Novel Gripper for Printing Presses.

One of the annoying features of the present type of swinging platen printing presses has been the difficulty of adjusting the grippers toward and from each other to properly engage sheets of different sizes. Heretofore, it has required the use of a wrench, and proper adjustment has been difficult, as the grippers were apt to slip too far one way or the other, thus consuming time and requiring care in the manipulation. The difficulty, however, has been overcome in a very simple and efficacious manner by Mr. Frank R. Stearns, of Greeley, Colo., who has obtained a patent on the invention. The improvement can be readily applied to old as well as new presses, for he uses the original frames and substantially the same shaped grippers as before. Instead of clamping-bolts and nuts, however, he journals in the frame a pair of separately rotatable shafts that have threaded engagements with the grippers. The inner ends of the shafts are journaled in a block secured in the guideway for the grippers and are held against detachment by a pair of screws that engage in grooves formed in the shafts. The outer ends of the shafts are provided with knobs or hand wheels, and spring fingers engage the same to normally prevent their rotation. With this mechanism, either or both grippers can be readily adjusted by simply turning the respective shafts, and thus can be moved toward or from each other and toward or from either side of the platen.

### Harnessing the Waves.

To operate a mill by the force of the ocean tides is an idea that has long since been put into practice: but to utilize the unceasing motion, not of the tides but of the waves themselves, is more of a novelty. This is the object of an apparatus recently patented to harness Neptune and to make him furnish motive power for all human needs. It consists of one or more barges—scow-like floats, launched upon the sea and anchored at such a

distance from the shore as to be always in deep water, where it will operate uniformly and in all weathers.

Along the bottom of each float runs a metal track, upon which are two little cars, one at each end, bearing heavy weights. The cars are connected by a rod, and as the boat rocks they roll back and forth along the track, at the same time operating a pair of pistons which compress air and, through a tube, furnish pneumatic power operating machinery upon the shore. The pumping mechanism may also be adapted to suck water from under the boat and pipe it to shore in a steady stream with sufficient force to operate a water motor on the beach. Thus is power had without recourse to coal. Such an invention, if practicable, would of course be preferable to the solar engine or windmill which can store up energy only while the sun shines or the wind blows briskly. The restless ocean would be a more dependable slave in harness than either old Sol or Boreas.

### Avoiding Railway Collisions.

The interest taken by the railway world in safety appliances was shown in a dramatic manner at the last international congress, when the delegates were treated to the exhibition of a gigantic collision. The purpose was to demonstrate the working of a new device for safeguarding trains, and the promoter of the scheme was George Westinghouse, who has been called the electrical wizard.

A train composed of fifty brand-new steel cars, just delivered, was made up, and to it was attached an ordinary locomotive. The train was cut into three pieces, two of which were allowed to stand idle on the track. The third portion, to which the engine was attached, was moved down the track some two miles. The engineer opened the throttle and the train rushed down the track at a speed of forty miles an hour. It crashed into the second section, and the latter into the third: but instead of piling the cars up on the tracks in a twisted mass of ruined steel, there was just a quiver, and then the three sections, automatically reunited, settled down on the rails as if nothing had happened.

All the cars were equipped with what is known as the friction draft gear, which absorbs the strains. The same performance was repeated with an electric locomotive, with equally satisfactory results.

Another device, by the aid of which a train can be automatically stopped, is under consideration by railway magnates. The invention, which serves not only to arrest the train without the aid of any of the employes, but also to notify one or more of the nearest railway stations of the occurrence, consists of a contact apparatus which is so placed between the rails that the plate, fastened to the lower part of the air brake pipe under the tender, is touched in passing over it. In consequence of this, a valve is opened and the train is stopped through the air brake.

The device is put up like a pendulum, attached to it being a counterweight, so that the apparatus which,

when in a vertical position, serves to close the line, can be turned down from the station of the nearest watchman by means of a wire, and the line in this way be opened.

The interior of the head of the apparatus contains a shell, made of insulated material, connected with three electric wires, well insulated from each other. The one in the middle is connected with a brass plate, while at the ends of the other two, brass contact springs are placed diametrically opposite each other. On each side of the brass plate a brass peg with a steel head is adjusted, which protrudes from the head of the contact apparatus. Both pegs are kept by springs in close proximity to the brass plate.

If, when the line is closed, the brass plate connected with the air brake pipe hits the head of the contact apparatus, the plate is thrown back, the valve of the air brake is thereby opened, and the train stops. In addition, the peg on that side is forced into the interior of the apparatus, the circuit becomes closed, and the bells connected with the wires are sounded. Through the joint use of several devices of this description, it is possible to avert a collision of a stopped train with others. The apparatus can be placed at any desired point, and operates in both directions: it has the further advantage of being relatively cheap.

In this connection, it is worthy of mention that an electric tablet system, successfully employed in New Zealand, is receiving the attention of railway men in this country. The purpose of this system is to prevent more than one train being between any two tablet stations at the same time: and when no train is in the section between the tablet stations, to permit a train to be started from either end. This is accomplished by every train carrying a tablet, one tablet only being obtainable from the tablet instruments of the same section at the same time.

### Power for Canals.

The patient mule has been superseded as a motive power for canal barges. The system of animal traction proved much too slow for this strenuous age, and the towpath has been abolished. On some canals in Ohio, the barges are hitched to passing electric cars, which convey them rapidly to their destination; on others, gas motor engines are employed. The gas motor barge has proved successful in England, where there is an elaborate canal system, offering cheaper rates of transportation than those afforded by the railways. Either coke or anthracite coal is burned in the producer, and the gas is generated from a mixture of air and steam, which is drawn through the incandescent fuel by the partial vacuum created by the outstroke of the piston in the engine. The gas is generated only as required, and there is therefore no danger of explosion. Moreover, the gas being produced only as it is needed by the engine and in quantities to suit the varying loads, there is no waste while the engine stands idle. The heat efficiency of the

complete gas plant is 23 per cent, as compared with 11 per cent for a steam engine. That is to say, the gas plant consumes less than one half the fuel which would be used in a steam engine and boiler of the same power. The weight of the plant is less than three tons, and the floor space occupied is about seven by four feet, the plant being six feet high. The use of these motor barges has done much to facilitate navigation.

The latest development in this line, however, is the propulsion of canal barges by electric power. The first experiments with electric canal boats were unsatisfactory, the engines being built symmetrically so that the vessels could be towed either up or down the canal. This did not work well, and a new plan, with a double system of rails, is now being tried.

At first, the experiment was made of having one wheel of the engine on a rail and the wheel nearest the canal on the ground. This did not give the best results, and both wheels now run on rails. The wheel frame has in front a turning frame with wheels 3 feet apart, and a fixed pivot and a hind longitudinal axle. The total weight of the locomotive is so distributed that the wheels on the land side have to bear the greater portion, in order to keep up the equipoise of the towrope. For the same reason, the pivot of the turning frame is not in the longitudinal axle of the locomotive, but several inches outside the same, toward the land side. Both axles of the turning frame are worked by a 10-horse power direct-current motor with double cogged gearing. The motor works at a tension of 550 volts, the speed and gearing being regulated by the usual parallel series. When traveling without load, the locomotive can go at a speed of three miles an hour when the series is used: and when the parallel multiple is used, this rate can be doubled.

The tow pole is worked by a one-horse electro motor specially provided for the purpose. At the upper end of the tow pole is a funnel through which the towing rope is led, and then wound round a drum. To work this drum there is another electro motor provided, which has a drawing power of more than 250 pounds. An automatic coupling connects the drum with its shaft, so that in case of any overburdening, the stability of the locomotive may not be endangered. The driver's place is fixed in front, and contains all the controllers for the various motors, the switch for working the tow pole, and a switch board for the gauges. The locomotive is also provided with the necessary accessories.

The tests to which these locomotives have been subjected have proved that they are thoroughly efficient, and at the same time that they are extremely economical. Canals are much more widely employed in Europe than in this country, as a means of conveying goods. There is a network of canals throughout Germany and France, and they are an important transportation agent in England. In the United States, the facilities offered by the railroads, together with the greater speed, have almost rendered them obsolete; but with the application of mechanical power to these waterways, new life may be given to canal traffic.



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Chair.....W. J. Fountain  
Chair.....M. F. Schrenkeisen  
Cheese cutting machine.....H. Grosse  
Cigar case.....M. Niell  
Cigar filler and preparing same.....O. Tyberg  
Circuit breaker, Automatic magnetic.....W. M. Scott  
Cleaning apparatus, Air.....G. I. Kindel  
Cleaning device, Tooth.....P. F. Roach  
Clinker extractor.....J. R. Place  
Clock, Electrically wound.....A. De Vos  
Clock striking mechanism.....L. L. Volpo  
Closet sanitary device.....A. F. Lesler  
Cloth on the bias, Device for marking or cutting.....S. Gould  
Clutch.....C. A. Sturtevant  
Clutch, Friction.....G. E. Franquist  
Clutch, Friction.....W. E. Magie  
Clutch mechanism, Friction.....T. S. Miller  
Coal chute, Extension.....F. S. Converse  
Coal tipple.....J. S. Pates  
Cock, Curb.....C. L. Wilkins

Cock and expansion valve, Combined stop.....F. W. Felsberg  
Coffin pedestal.....W. R. Sparkman  
Coin former.....J. W. Lundskog  
Coin tester for slot machines.....M. D. Sadtler  
Collar.....E. L. Hoover  
Collar fastener.....J. A. Coyner  
Collar, Harness breast.....T. D. Gordon  
Collars, Machine for folding turnover.....H. W. Messer et al  
Collector ring.....H. Geisenhoner  
Concrete pile.....J. Kahn  
Concrete structures, Anchorage for.....J. A. Brown  
Condenser.....N. P. Towne  
Condenser, Steam.....A. Pennel  
Controller and dimmer switch, Combined.....J. W. Pierce  
Core.....W. P. Firey  
Core making machine.....W. H. Larrison  
Cotton planter and fertilizer distributor, Combined.....A. C. Taylor  
Cotton, Treating.....G. D. Burton  
Counter, Revolution.....H. P. C. Browne  
Cover, Machine.....R. A. Bostelman  
Creaming can.....H. A. Arvig  
Crib construction.....F. Simpson  
Cross tie, Sectional metallic.....J. P. Ashby  
Cultivator.....W. C. Children  
Cultivator attachment.....C. M. Weempe  
Current collector.....A. Linden et al  
Current motor, Alternating.....M. Milch  
Current tap and lamp socket, Swiveling.....C. F. Howes  
Curtain fixture.....E. F. Henderson  
Curtain pole bracket.....G. F. Tait  
Curtain shade fixture.....C. W. Moore  
Cuspidor.....W. C. Kirk  
Cuspidor or spittoon.....P. M. Freer  
Dash pot.....W. R. Whitney  
Dental instrument.....L. H. Crawford  
Dental swaging apparatus.....L. H. Crawford  
Desiccating apparatus.....J. C. McLachlan  
Desiccating or evaporating apparatus.....W. E. Jaques  
Desk and seat, Combined.....H. G. Lippard  
Die stock.....W. E. Brooke  
Die stock.....H. W. Oster  
Dish pan.....J. J. Meyer  
Door securer.....G. H. Foster  
Doors, &c., Registering locking bolt for.....J. F. Pixley  
Drill.....S. A. Casparis  
Drill grinding machine.....R. L. Morgan et al  
Driving mechanism, Velocipede.....A. Schaad-Vogeli  
Dust separator and collector, Combined.....O. M. Morse  
Dye and making same, Ortho-oxymonoazo.....K. Schirmacher et al  
Ear trumpet.....C. W. Levalley  
Earthenware, &c., Pipe joint for.....C. H. & E. H. Bentley  
Eaves trough hangers, Machine for forming.....H. A. Gibbs  
Egg beater.....A. T. Stewart  
Electric alarm.....W. O. Rehn  
Electric light support.....O. C. White  
Electric machine, Dynamo.....L. A. Tirrill  
Electric machine, Static.....O. Baysdorfer  
Electric signaling.....2 pats. J. B. Struble  
Electric switch.....G. W. Richardson  
Electric switches, Controlling C. E. Eveleth  
Electroplating cylindrical articles, Apparatus for.....R. C. Totten  
Electrostatic separation.....G. W. Pickard  
Electrostatic separation, Apparatus for.....G. W. Pickard  
Elevating jack.....T. J. Cope  
Elevator.....A. J. Myer  
Elevator and carrier.....J. M. Boyd  
Elevator plunger guide.....J. A. Anderson  
Elevator safety gate mechanism.....W. D. Kehl  
Engine.....E. A. Maynard  
Engine steering mechanism.....N. Dreis  
Engine, Valve gear steam.....J. W. Davis  
Envelop, Return.....D. T. Boston  
Excavating device.....J. Austin  
Excavator.....W. R. Martin  
Excavator shovel.....L. W. Connell  
Exercising bag.....2 pats. W. G. Wood  
Eyeglasses.....E. P. Sawtelle  
Fabric scouring machine, Woven.....C. Wilmsen  
Fabrics, Machine for cutting weft pile.....O. Drey  
Fan and motor for operating the same by compressed air.....J. L. Creveling  
Fastener, Sash cord.....W. & W. F. Lear  
Feed water heater.....D. Halpin  
Feeders, Automatic stock compensating device for card.....G. Geb  
Feeding mechanism, Ratchet.....H. John  
Fence machine, Wire.....C. F. Leonard  
Fence making machine.....J. Harris  
Fence, Wire.....J. Harris  
Fence wire stretcher.....H. Murrell  
Fencing, Woven wire.....C. Griswold  
Fermenter.....D. Gordon  
Fiber material from animal tendons or sinews, Manufacturing.....S. Kohn  
Filter.....2 pats. J. T. H. Paul  
Filter, Centrifugal.....T. S. Patterson  
Finger ring expander.....A. F. Boylan et al  
Fire escape.....C. F. Davy  
Fire extinguisher.....H. W. Mix  
Firearm, Automatic.....W. J. Whiting  
Fireproof blinds, Seat for constructing.....2 pats. H. E. Vance  
Fish, Apparatus for catching.....O. G. Bohtho  
Fish, Preserving.....W. Lamb  
Float mechanism.....P. S. Mauritzen  
Floors, Laying patterned cement.....E. Bidtel  
Flower supporter.....A. Helm  
Fluid gage.....M. Martin  
Foldable stand.....E. J. Whitlow  
Folding machine.....A. B. Dick  
Folding table brace.....P. F. Swart  
Forging machine.....reissue. O. Briede  
Friction clutch for vises, lifting jacks clamos or the like.....P. Broadbooks  
Fuel compound, Emulsion.....W. F. Browne

Furnace.....J. V. Martin  
Furnace stock distributor.....J. D. Pugh  
Gaff hook.....R. C. Livingston  
Game apparatus.....A. F. Gillet  
Game board, Roulette.....W. W. Russell  
Game maul.....J. V. S. Paddock  
Garment clasp.....J. H. Geisel  
Garment supporter clasp.....J. H. & I. Taylor  
Gas, Apparatus for manufacturing.....P. I. Cohen  
Gas, Apparatus for the manufacture of illuminating.....C. W. Billinger  
Gas burner.....I. C. Dally  
Gas generator, Acetylene.....A. F. Chace  
Gas lighting and extinguishing apparatus, Time.....T. F. Westenholtz  
Gas machine, Acetylene.....F. P. Cave  
Gate.....A. W. Crigler  
Gate.....F. E. Nelson et al  
Gate.....F. A. Guth  
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Gear, Reversing.....A. S. Reed  
Gear, Variable speed and reversing.....H. W. Leonard  
Gearing, Change speed.....W. B. Pearson et al  
Gearing, Differential.....E. P. Gray  
Gin rib.....F. D. Allgood  
Glasses, Apparatus for shaping.....F. L. O. Wadsworth  
Glass machine, Wire 2 pats. R. W. Davies  
Glass, Making prism.....F. L. O. Wadsworth  
Grab.....G. J. Hone  
Grain cleaning machinery.....F. W. Comstock  
Grinding mill.....A. W. Straub  
Guide for sewing braid binders to skirts, Adjustable slide.....M. J. Giles  
Gun, Discharge actuated.....S. N. McClean  
Gun having recoil barrel and adjustable brake.....K. Voller  
Guns, Automatic single trigger mechanism for double barrel.....I. Kautzky  
Hair retaining device.....R. B. Osterhoudt  
Hammock chair.....S. F. Calbeck et al  
Handcuff.....F. E. Olcott  
Harrow.....W. E. McCann  
Harrow scraper, Disk.....S. V. Kennedy et al  
Harvesters, Boll opening and cleaning mechanism for cotton.....W. M. Berry et al  
Harvesting machine, Cotton.....N. Bowditch  
Hat and coat rack.....W. C. Yutzy et al  
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Heater.....A. M. Loudon et al  
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Heating device, Chemical.....W. Espenbavn et al  
Heating system, Steam.....F. C. Goff  
Hewing machine, Timber.....W. K. Melton  
Hog gambrel, Self spreading.....C. N. Walker  
Hoisting and conveying apparatus.....F. W. Lovell  
Hoisting machine.....P. Bauch  
Honing stop.....G. R. Craw  
Hook and eye.....O. V. Hoopengardner  
Hoop forming and splicing machine.....N. K. Bowman  
Horse rake.....C. Hockin  
Horseshoe, Lock.....W. Basjanoff  
Hydraulic motor.....J. L. Mariner  
Hydrosulfite solutions, Making.....P. S. Clarkson  
Indicator.....M. Lighty et al  
Insulating support for electrical conductors.....W. K. Gibboney  
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Iron or steel sheets, Making copper coated.....W. P. Lewis  
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Ironing board.....F. Hofacker  
Jars and jelly glasses, Fiber closure for.....G. T. Reed  
Jars and other vessels, Closure device for.....W. R. Greiner  
Key.....I. Ash et al  
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Keyless lock.....G. W. Strong  
Knitting machine.....J. D. Hemphill  
Lamp, Incandescent gas.....L. T. Alton  
Lamp, Intense light.....P. Lucas  
Land roller.....W. H. Teaby  
Land roller.....S. Warner  
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Lath dog.....H. E. Clark  
Lavatory apparatus.....F. E. Wilkison  
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Lenses, Making bifocal.....C. N. Brown  
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Line holder and type chase.....F. W. Weeks  
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Loom take-up, Narrow ware.....S. W. Wardwell  
Loom, Weft replenishing.....A. E. A. & G. Walker  
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Lubricator.....A. A. Stelting  
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Mail box.....J. H. Van Dorn  
Mail carrier.....F. S. Jolly  
Mail delivering device.....F. W. Renner  
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Massage instrument.....I. A. Weston  
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Match safe.....B. S. Martin  
Match safe.....J. Roemisch  
Mattress support, Spring.....J. M. Blocher  
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Metal sheets or plates, Apparatus for making corrugated.....W. G. Causser  
Metals, Brazing.....L. L. White  
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Micrometer gage.....J. C. E. Leach et al  
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Milking machine.....G. Hutchinson  
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Molding machine.....H. Tscherning  
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Motor control.....J. E. Noeggerath  
Motor starting device.....E. Batisse  
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Movement transmitting mechanism.....W. B. Pearson et al  
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Musical instrument, Mechanical.....J. McTammany  
Musical instruments, Music sheet or paper for mechanically operated.....T. W. Smillie  
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Nest box.....J. W. Edwards  
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Nut cracker.....J. B. P. Miller  
Nut lock.....B. Watts  
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Nut lock.....W. Burton  
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Oil cup, Automatic.....J. A. Anderson  
Oil or hydrocarbon burner.....A. M. Hunt et al  
Oil well appliance.....R. E. Grant  
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Ores, Treating.....F. J. Crane  
Overshoe attachment.....W. H. Tillson  
Ozonizers, Apparatus for mounting and cooling statical.....M. Otto  
Package, Coffee.....H. D. Terrell  
Packing case.....A. R. Speer  
Paddle wheel, Feathering.....W. N. Cruchon  
Paint.....D. J. Joslin  
Paint.....C. A. Lundquist  
Paintings, Producing copies of oil.....H. Bogarts  
Paper machine.....J. Walsh  
Paper, &c., Machine for cutting and delivering sheets of.....C. P. Cottrell  
Patterns from molds, Apparatus for drawing.....J. H. B. Ryan  
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Pen and pencil case, Revolving.....G. Kohlmeier  
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Photographic shutter.....G. Dietz  
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Pick.....W. G. Fine  
Pipe connecting member.....reissue. J. D. Tschopik  
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Plow attachment.....H. D. Taylor  
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Potato masher.....C. C. Naeve  
Powder strip cutting machine.....J. T. Thompson  
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Power transmission device for motor cars, &c.....W. von Pittler  
Pressure regulator.....T. A. Mighill  
Printer's and embosser's make ready.....J. W. Harris et al  
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Pulley, Sash.....F. S. Clarkson  
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Rag shredder.....C. W. Griffin  
Rail and bracket, Toe.....D. L. Tschantz  
Rail joint.....W. D. McCurdy  
Rail joint.....J. M. Tadlock  
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Railway switch.....H. A. Rosback  
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Railway switch mechanism.....T. Bamford  
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Railway traffic controlling apparatus and system.....H. Bezer  
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 Ratchet mechanism I. M. Hackney  
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 Recording mechanism. Automatic H. Darwin  
 Reduction machine. Refuse D. P. Carrille  
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 Revolvable members. Mechanism for intermittently rotating and stopping W. B. Pearson et al  
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 Roll, journal bearing, and the like E. J. Francis  
 Rolls on their axes. Clamp for fastening stone couch-rolls and wet press G. Renker  
 Roof carline G. B. Matby  
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 Rotary engine T. T. Bevan  
 Rotary explosive motor S. Denton et al  
 Rubber articles. Making hollow hard W. W. Weitling  
 Rubber dam clamp and holder. Combined H. J. Hansen  
 Rule. Folding J. A. Traut  
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 Ruler and blotter. Combined I. I. Sides  
 Saddle G. C. Cox  
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 Sash fastener D. G. Saunders, Jr  
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 Scale and producing iron sulfate. Electrolytically removing C. J. Reed  
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 Seal, bottle S. Mathieu  
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 Sealing closure for vessels G. T. Reed  
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 Self-feeding furnace W. I. Ely  
 Sewer gas trap J. P. Putnam  
 Sewing machine Broom A. E. Miller  
 Sewing machine take-up 3 pats. L. Onderdonk  
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 Sewing machines. Chain-stitch looper for lock-stitch 2 pats. A. G. Lamb  
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 Shade roller raising, lowering, and supporting device W. N. Dunn  
 Shears T. C. Smith  
 Shears for cutting metals. Reversible C. Horn  
 Sheets for tinning. Making W. P. Lewis  
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 Sign holder. Street F. P. Flowers  
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 Silver solvent. Selective F. J. Hobson  
 Siphon. Beer G. Piller  
 Skate wheel. Roller H. A. Kohler  
 Skewer pointing machine G. K. Tyler  
 Sled propeller J. McGillis  
 Slicer. Fruit C. M. Heffron  
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 Spirits of turpentine. Digester for extracting F. D. McMillan  
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 Spraying machine J. W. Patterson  
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 Stacker and loader. Hay C. J. Dlouhy  
 Stamp J. M. Campbell  
 Stand W. H. Smead  
 Steam boiler water circulating apparatus J. N. Barnum  
 Sterilizer and pasteurizer S. G. Scanlan  
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 Stop motion for pit cages, hoists, &c. G. Dunkelberg  
 Storage bin G. H. Warren et al  
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 Stove ash dump A. C. Anderson  
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 Stump extractor L. & J. S. Swenson  
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Telegraph system. Wireless 2 pats. L. de Forest  
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 Tent peg J. E. Gorrell  
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 Tickets, records, &c. Holder for A. F. Macdonald  
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 Tile press P. L. Simpson  
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 Tire. Vehicle F. E. Newcomb  
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 Typewriter. Vertical plane H. S. Duas  
 Typewriting machine J. Ziegler  
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 Underreamer E. C. Wilson  
 Valve W. Von Kothen  
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 Vehicle signal A. H. Rosing  
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 Washing and disinfecting apparatus J. G. Branch  
 Washing machine F. Brucker  
 Washing machine dasher or stirrer-head W. H. Voss  
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 Water. Apparatus for purifying S. L. Sheuerman et al  
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 Water level. Device for indicating at a distance the height of a F. Rittmeyer  
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 Wire drawing machine J. A. Horton  
 Wire fence machines Steering and brake mechanism for C. F. Leonard  
 Wire reel A. Asper  
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 Wrapping machine M. H. Ballard  
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 Writing machine J. B. Vidal  
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 Carpet border F. A. Baas  
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 Incense burner J. M. Schutz  
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 Lighting fixtures. Backpiece for 2 pats. H. E. Watkins  
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 Agricultural implement G. C. Stanley  
 Air brakes and means to start automobiles G. W. Young

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 Air. Means for increasing the work obtainable from a charge of compressed W. H. Sodeau  
 Ale and beer casks. Apparatus for maintaining air pressure in E. R. Brown  
 Alkaminester 2 pats. F. Stojet al  
 Anesthetics. Apparatus for administering liquid J. A. Hollenberger  
 Animal trap C. T. Owens  
 Asbestos Treating A. H. Hippie  
 Ash pit door A. E. Johnson  
 Audiphone. Pocket E. W. Schneider  
 Automatic signal W. A. True  
 Axle and wheel T. E. Lambert  
 Axle. Vehicle R. H. Berkstresser  
 Bales. Means for compressing S. J. Webb  
 Balling press. Cotton H. Jones et al  
 Ball pitcher and catcher O. J. Panches  
 Basket making machine 2 pats. J. Farrell  
 Baskets and trucks. Metallic frame for W. M. Morris et al  
 Bearing. Ball M. Harris et al  
 Bearing for revolving shafts P. Schou  
 Bearings. Lubricating spindle M. an Haack et al  
 Bed attachment J. P. Williams  
 Bed pan A. E. Betts  
 Bed. Sofa W. J. Kelly  
 Bedstead attachment C. P. Brown  
 Belt fastener I. Jackson  
 Belt. Waist H. J. Galsman  
 Berth and settee. Combined folding J. P. Lein  
 Berth. Collapsible J. P. Lein  
 Binder. Loose leaf E. A. Trussell  
 Blotting pad J. Veit  
 Blowing machinery A. C. E. Rateau  
 Boat B. Tenneson  
 Bobbin boring machine C. L. Bailey  
 Book. Banking F. McClain  
 Book marker. Adjustable and automatic J. F. Wise  
 Books. Manifold sheet for loose leaf C. Rust, Jr  
 Boring rods. Supporting means for A. C. Mamara  
 Bottle I. C. Dicks  
 Bottle M. J. Fitzsimmons  
 Bottle filling machine C. F. Jenkins  
 Bottle lock G. A. Quimby  
 Bottle. Non refillable J. B. Zorn  
 Bottles. Machine for capping H. Robinson  
 Box F. L. Upjohn  
 Brake beam fulcrum. Reversible F. W. Cox  
 Brake shoe fastening S. Webb  
 Bread making compound H. F. Soliday  
 Bridge bit and its connection S. Pollock  
 Brush and comb. Combined T. J. McCloskey  
 Brush. Tooth G. Engel  
 Bucket blanks. Producing P. A. Lorenz  
 Bucket. Trip P. Entringer  
 Buggy boot closure T. Bartholomew et al  
 Building material M. W. Marsden  
 Button S. Gray  
 Cabinet J. L. Coleman  
 Cabinet. Knockdown P. Morrison  
 Cable joint housing J. Anderson  
 Cable take up B. A. Fuller et al  
 Call system W. J. McCollard  
 Camera bellows support J. Goddard  
 Camera. Photographic J. Frachebourg  
 Can body forming machine J. Eldridge  
 Can heads. Means for detecting defective G. H. Stewart  
 Candle socket H. F. Nehr  
 Canister top 2 pats. W. S. Stapley  
 Car coupling A. J. Bazeley  
 Car coupling release rigging J. E. U'ish  
 Car. Double decked G. E. Luce et al  
 Car. Electric tram G. J. Conaty  
 Car. Gondola 2 pats. R. G. Hutchins  
 Car. Railway C. Zimmerman  
 Car replacer N. F. Hess  
 Car uncoupling mechanism A. J. Bazeley  
 Car underframes. Draw bar spring pocket attachment for metal H. M. Pfleger  
 Car wheel. Self oiling R. F. Phillips  
 Carbid. Manufacture of H. L. Hartenstein  
 Carburetor A. W. & W. K. Menns  
 Carburetor H. B. Cornish  
 Carburetor T. H. Glascoe  
 Carpet fastener. Stair F. W. Wright  
 Cartridge cleaning apparatus J. H. Hart  
 Cash recorder I. S. Dement  
 Cash till and register F. W. Baynes  
 Cattle guard J. W. Wyatt  
 Centrifugal separator J. J. Berrigan  
 Chain coupling. Boom A. J. Foucher  
 Cheese making machine J. W. Meaker  
 Cheese cutter A. K. Gillespie  
 Cigar cutter E. Brunhoff  
 Cigar tip cutter E. Brunhoff  
 Cigarette making machine C. de Cazen  
 Circuit interrupter. Electrical H. Besser  
 Clip A. E. Glascock  
 Clothes draining device L. T. Cook  
 Clothes line holder A. K. Young  
 Clutch A. F. Hanson  
 Clutch mechanism J. F. Doepper  
 Coin holding and delivering machine J. W. Meaker  
 Coking oven H. J. Wickham et al  
 Collapsible gate C. Meyer  
 Collar pad. Horse D. S. Brown  
 Collar. Pneumatic horse J. R. Barkholder  
 Coilers. Machine for riveting horse A. W. Berndt  
 Combs. Making J. Koenig  
 Composition of matter L. F. Johnson  
 Composition. Priming K. W. Will  
 Concrete Reinforced A. Thomas  
 Concrete tanks and buildings. Holding and raising forms for buildings F. E. Vansant  
 Concrete wall mold J. J. Daniel  
 Condenser C. M. Mld  
 Condenser J. Schwager  
 Continuous piston engine J. C. Jarvis  
 Corn elevator A. Otto, Jr  
 Cornet C. G. Conn  
 Cot and crib. Combined A. W. O'Brien  
 Cotton compress S. J. Webb  
 Cotton gin roller H. Peterson  
 Cotton picker H. P. Childress  
 Counting machine. Stop G. Hoepner  
 Cover removing mechanism G. Webster  
 Crate. Shipping B. S. McCain  
 Cream and milk cooler T. Carter et al  
 Cultivator 2 pats. W. L. Tucker  
 Cultivator 2 pats. S. L. Allen

Cultivator drag bars or beams. Adjusting device for S. E. Bailor  
 Current motor S. E. Smith  
 Curtain protector E. Weggenuth  
 Cuspidor L. K. Vane, Jr  
 Cuspidor holder and cleaner J. D. De Lange  
 Cutting die P. A. Lorenz  
 Cycle. Ice F. W. Lehman  
 Damper M. McCormick  
 Damper. Automatic stove W. R. Bord  
 Dash pot H. M. Crane  
 Dental articulator F. W. Stepha  
 Dental metal crowns. Apparatus for stamping and shaping A. Grunstein  
 Desk. Folding L. & A. Jensen  
 Desk. School W. C. Toler  
 Desk seats. Hinge for school J. Zimmer  
 Die stock H. J. Carmody  
 Dipper. Cream L. E. Mandeville  
 Directory. Telephone D. F. Whitcomb  
 Display stand L. D. Jenkins et al  
 Ditching machine J. B. Hill  
 Door closer E. V. Sinz  
 Door hanger and fixture. Sliding E. McLeod  
 Double draft kiln D. P. Guise  
 Draft equalizer J. A. Smethers  
 Draft regulator G. H. Tarleton  
 Dredge. Steam and hydraulic T. Shade  
 Drill disk scraper T. Brennan, Jr  
 Drill holder. Portable T. B. Powers  
 Drilling jig. Automatic C. H. Darling  
 Drum oil guard. Friction A. A. Lambert  
 Drums. Friction thrust for loose A. Lambert  
 Duck call J. W. Reynolds  
 Dust guard F. E. Holt  
 Dust laying and absorbing composition B. Singer  
 Ear muffle J. R. Eegelman et al  
 Eaves trough D. L. Johnson  
 Egg case filler R. J. Carrier et al  
 Electric battery 2 pats. I. Kiteee  
 Electric cell J. Kiteee  
 Electric circuit I. Kiteee  
 Electric circuit coupling apparatus N. F. Niederlander  
 Electric elevator D. Larson  
 Electric light pendant. Extensible G. B. & R. C. Clarke  
 Electric motor support J. G. Crawford  
 Electric transmission of intelligence I. Kiteee  
 Electrical controller 2 pats. D. Larson  
 Electrical interrupter H. Besser  
 Electromagnetic locking switch H. M. Crane  
 Electrostatic separator M. Woodsome  
 Elevator J. Wunderlick  
 Elevator C. W. Jackson  
 Embroidering machine presser foot G. W. Lankford  
 Enameled ware Manufacturing clean edges in K. Gossweiler  
 Engines. Automatic alarm and stopping device for B. D. Adams  
 Engines. Means for reversing and controlling internal combustion J. W. Slater  
 Exercising apparatus for correcting deformities F. Langel  
 Explosive engine igniter J. Boyle  
 Extension table F. J. & I. T. Seng  
 Eye for garment hooks. Sheet metal G. E. Barber  
 Eyeglasses A. A. Low  
 Eyeglasses L. L. Stone  
 Fabric. Machine for shrinking L. H. Carleton et al  
 Feed and lifter carrier W. D. Beatz  
 Feeding device. Poultry W. J. Manly  
 File. Newspaper H. L. Snyder  
 Filter F. Benoit  
 Finishing machine. Edge A. E. Ayer  
 Fire alarm system P. E. Tarlton  
 Firearm. Tubular magazine 2 pats. T. C. Johnson  
 Fire protection signal system J. E. Shepherd  
 Fire protection system 2 pats. J. G. Nolen  
 Firearms. Cartridge carrier for A. J. Savage  
 Fish hook W. Shakespear, Jr  
 Fish plates. Manufacturing R. B. Charlton  
 Fishing reel J. J. Grignon  
 Fishing rod case or holder E. A. Lamphier  
 Floor scraper H. S. Durke  
 Flour flakes produced by the smooth rolls in flour milling and for kindred purposes. Apparatus for conveying and disintegrating G. Hudocz  
 Fluid feed indicator. Visible C. L. Graham  
 Fluid pressure brake G. L. Starr  
 Fluid pressure brake A. Parker-Smith  
 Flushing tank B. Eastwood  
 Fly and other insect escape V. Oberling  
 Folding chair H. Nichols  
 Folding table L. K. Gibbs  
 Follower block B. C. Bradley  
 Foods. Drying A. T. Jones  
 Footscraper F. C. Lancaster  
 Forceps J. Somers  
 Fork L. E. Fatch  
 Foundry flask clamp O. F. Lindberg  
 Fuel feeding apparatus. Fine G. L. Swift  
 Furnace A. Locher  
 Furniture sliding shoe O. C. Little  
 Gage glass holder H. Del Mar  
 Game table M. M. Johnson  
 Garment clasp E. H. Heath  
 Garment hook F. D. Scott  
 Gas burner. Incandescent M. H. Samson  
 Gas engine H. J. Smith  
 Gas engine P. Mohrdeck  
 Gas main bag J. H. White  
 Gas. Producing H. Gerdes  
 Gear. Firing S. A. S. Hammar  
 Gear. Friction draft G. I. King  
 Gear. Variable speed and reversing F. Markgraf  
 Generator and superheater S. Z. de Ferranti  
 Glass furnace D. J. Ghrist  
 Glass. Manufacturing J. R. Speer et al  
 Glassware. Machine for the manufacture of pressed and blown C. E. Blue  
 Glue press G. F. Steger  
 Governor. Engine E. Hill  
 Grater. Vegetable J. Charky  
 Grinding mill J. N. Bosch, Jr  
 Grinding mill J. H. Reece  
 Gun barrel C. R. Bellamy  
 Harvester F. Hamacheck  
 Harvesting machine. Cotton J. F. Appleby  
 Hay carrier W. London  
 Hay press B. C. Bradeley  
 Hay rake E. A. Johnston



- Head gate ..... U. F. McBurney  
Headlight, Locomotive ..... E. C. Sawyer  
Headlight operating device ..... G. B. Gardner et al  
Heat radiating pin ..... H. A. Knox  
Heating furnace, Rotary ..... J. McGaff  
Heating system ..... J. O'Neill  
Hinge construction, Locking ..... W. J. Kelly  
Hinge for sofa beds, &c. Reversible ..... O. H. Watkins  
Horseshoe ..... M. D. Glassbrooke  
Horticultural and other structures, Glazing of ..... E. Bouteille  
Hose coupling ..... J. F. Polmann  
Hydrocarbon apparatus ..... J. Landsiedel  
Incubator ..... H. C. & E. C. Aiken  
Incubator ..... G. H. Boyd  
Injector, Water pressure ..... J. H. Venners  
Ink well ..... J. Muirhead  
Insulating coverings, Form for making fiber ..... W. H. Baker  
Iron or steel articles, Manufacture of ..... E. E. Pierce  
Iron or steel objects, Treating ..... H. L. Hollis  
Ironing board ..... J. H. Wilkins  
Ironing stands and the like, Wheeled support for ..... W. H. Flake  
Jar and jar closure ..... J. E. Lord  
Jars for the preservation of foodstuffs, Composition of matter for hermetically sealing ..... J. E. Lord  
Journal box ..... G. A. Woodman  
Journal box lubricating device ..... J. G. Smith  
Kitchen table and cabinet ..... G. A. Stromgren  
Knockdown table ..... J. S. Westby  
Knuckle pin stop block ..... G. A. Hart  
Lacer, Shoe ..... R. M. Miles et al  
Ladder ..... F. B. Pease  
Lamp burner ..... J. H. Morrison  
Lamp guard ..... C. Molitor  
Lamps, Means for automatically extinguishing ..... E. J. Frost  
Lead refining apparatus ..... A. G. Betts  
Leaf turning apparatus for books, music, &c ..... L. G. Giles  
Leg, Artificial ..... W. E. Erwin  
Letter and inclosure, Combined illustrated ..... J. T. H. Mitchell  
Leveling reel ..... E. Wiswall  
Lid fastening means for receptacles ..... J. A. Snigo  
Lifts, elevators, conveyers, &c. Means for controlling electric ..... H. C. E. Jacoby  
Light fixture ..... W. B. Brown  
Liquid dispensing apparatus, Recording attachment for ..... E. C. Graham  
Liquid filling apparatus ..... S. Schlangen  
Loading and unloading device ..... P. E. Van Berendonck  
Locks, Locking device for permutation ..... F. Dueterwald  
Log, Stay ..... E. F. Smith et al  
Loom jacquard actuating mechanism ..... E. A. Schneider  
Loom picking mechanism ..... W. T. Roper  
Loom shuttle ..... A. E. Benson  
Loom shuttle positioning device ..... F. O'Donnell  
Lounging chair ..... W. Williamson  
Lumber joining machine ..... A. T. Linderman  
Mail bag holder ..... W. E. D. Everest  
Mail boxes, Crane for rural ..... J. B. Mellinger  
Mantle burner, Acetylene ..... C. Holmok  
Match box ..... O. C. Sobolewski  
Match box ..... G. A. Demo  
Matrix making machine ..... L. E. Levy  
Merry-go-round ..... W. W. Tice  
Metal hoop ..... J. E. Wright  
Metal treating, refining and purifying apparatus ..... W. S. Simpson  
Metals, Making composite ..... T. A. Edison  
Microscope, Micrographic O. H. F. Vollbehr  
Milk can seal ..... W. F. Brunssen  
Milk pail support ..... J. Kuhn  
Milk receptacle ..... G. W. Maxwell et al  
Mining machine, Coal ..... S. N. Mighell  
Miter box ..... W. B. Spear  
Mold ..... I. Robbins  
Molding machine ..... H. J. Schade  
Motor ..... W. G. Bloss  
Motors, Commutating alternating current electric ..... H. Weichsel  
Mower or reaper guard finger ..... F. Hamachek  
Musical instrument reel holder ..... E. D. Snodgrass  
Musical notation ..... A. C. Davis  
Nest, Poultry ..... A. C. Chase  
Nest, Trap ..... H. G. Leisenring  
Net ..... H. J. Hughes  
Noodle machine ..... H. Herschel  
Nut lock ..... H. B. Eareckson  
Nut lock ..... J. J. Potter  
Nut lock ..... T. Cronin  
Nut lock ..... B. W. Dicken  
Nut lock ..... L. W. Laye et al  
Oil burner, Vapor ..... C. R. Umbenhower  
Oil burning furnace ..... H. Yoerg et al  
Operating table ..... J. D. Williams  
Oscillator, go-cart, sled and step ladder, Combined ..... J. A. Crandall  
Oxyacids of chlorine, Producing salts of ..... A. E. Gibbs  
Packing case, box, &c ..... F. A. Wilson  
Packing for stuffing boxes, Metallic A. Siems  
Packing, Piston ..... T. W. W. Smith  
Pail, Milk ..... L. Leavitt  
Paper ..... J. H. Greenstreet  
Paper box making machine ..... E. H. Taylor  
Paper, Grease and moisture proof ..... A. Weingaertner  
Paper holder, Sticky fly, G. & C. C. Laube  
Paper making machinery ..... R. B. Wolf et al  
Paper, paint, &c. Moistener or softener for ..... M. E. Hamill  
Paper roll holder ..... W. H. Hoell  
Paper web in paper making machines, Apparatus for smoothing the ..... C. Tittel  
Pea grader ..... J. H. Empson  
Pea and pencil holder ..... C. Weaver  
Pen, Fountain drafting ..... G. P. Smith et al  
Pencil knife ..... J. H. Galland  
Photographic printing apparatus ..... W. L. Bierbrauer  
Piano action ..... L. H. Battalia  
Piano attachment, Automatic ..... F. P. Smith  
Picture hanger ..... C. S. Armstrong  
Pin ..... W. E. Henderson  
Pipe carrier ..... C. F. Porteous  
Pipe coupling ..... A. J. Michel  
Pipe cutting or indenting machine ..... W. Haas et al  
Pipe or hose coupling ..... C. E. Lingenfelter  
Pipe wrench ..... J. W. Lind  
Planter and marker, Automatic check row corn ..... R. F. Fleak  
Planter, Corn ..... L. D. Benner  
Plow ..... W. H. Gant  
Plow ..... W. H. Gant  
Plow ..... S. V. Weeks  
Plow attachment ..... N. G. Mercer  
Plowshare, Boltless ..... F. Buff  
Poacher, steamer and heater, Combined ..... J. Truman  
Post or letter card ..... R. C. Baker  
Potato cutter and planter ..... J. J. Simon  
Potatoes, Knife for cutting seed ..... W. O. Cassidy  
Power table and power attachment for tables ..... J. T. & D. Beswick  
Power transmitting device ..... C. E. Brooks  
Press ..... W. Fullard  
Printing machine feed ..... F. P. Sharp et al  
Printing press ..... E. Burge  
Pulley block ..... F. S. Clarkson  
Pulp molding machine ..... G. R. Ward  
Pulp molding machine ..... C. D. Ormiston  
Push buttons, Press tool for the manufacture of ..... G. F. & A. J. Grove  
Pump, Air ..... N. W. Dible  
Pyrotechnic device ..... H. J. Pain  
Rail bond ..... C. R. Sturdevant  
Rail joint ..... J. D. Manese  
Rail joint ..... G. H. Marshall et al  
Rail joint ..... W. J. Overton  
Railway brake ..... S. Britton  
Railway crossing track mechanism ..... J. W. Renner  
Railway gate, Electric ..... A. C. Worland  
Railway signaling ..... T. E. R. Phillips  
Railway switch, Electromagnetic ..... R. A. Baldwin  
Railway tie ..... E. W. Wimberly  
Railway tie ..... A. B. Mason  
Railway tie ..... J. W. Pemple  
Railway tie ..... C. J. Kopf  
Range, Gas ..... H. W. Lawrence  
Ratchet wrench ..... J. E. Bowser et al  
Relay ..... W. W. Dean  
Riveting device ..... J. Petrelli  
Roasting or oxidizing furnace ..... C. E. Dewey  
Rock breaker and pulverizer ..... W. A. Merralls  
Rock splitting machine ..... F. Newham  
Roost and nest support, Combined ..... J. R. Callahan  
Rope untwisting machine ..... F. A. Kaiser  
Rossing machine ..... J. Moreau  
Rotary engine, 2 pats ..... O. Williams  
Rubber warming and mixing mill ..... C. F. Obermaier  
Rule, Measuring ..... R. Morehouse  
Sack tie, Grain ..... W. T. Oxley  
Saddle iron ..... J. Ecker  
Safe bolt actuating mechanism ..... E. A. Strauss  
Sales check holder ..... E. D. McKenna  
Sand mold making machine ..... H. Karow  
Sash holding device ..... W. M. Ducker  
Sash operating mechanism ..... G. P. Bull  
Sash supporter ..... W. M. Ducker  
Scale, Spring dial ..... G. W. Robinson  
Score board ..... T. E. Carey  
Screw threads on pipes, &c. Apparatus for cutting ..... F. D. Cable  
Screw wrench, Universal ..... J. T. F. Conti  
Seat back for drivers' seats, 2 pats ..... R. H. Yale  
Secondary battery, 2 pats ..... W. Gardiner  
Sewer traps, Combined ventilator and clean out for ..... T. F. Foley  
Sewing machine, Shoe ..... F. L. Alley  
Shade and curtain roller support, Combined ..... J. Stoecklein et al  
Shade bracket and curtain pole support, Combined ..... W. T. Slawoszewski  
Shaving device ..... B. vom Elgen  
Shears ..... W. J. Hancock  
Sheet metal can, Armored ..... T. Reis  
Shoe polisher ..... W. P. Muller et al  
Sign, Automatic door ..... E. H. W. Stahlhuth  
Sign, Illuminated ..... R. R. Wiley  
Signal ..... W. A. Richardson  
Signal apparatus, Train ..... J. R. Munroe  
Silk, Apparatus for the manufacture of artificial ..... H. E. A. Vitenet  
Silver extraction, 2 pats ..... F. J. Hobson  
Slotting or splining machines, Arbor or mandrel for ..... G. A. Owen  
Small arm, Breech loading ..... J. B. Thorneycroft et al  
Smoke ejector ..... L. E. Crane et al  
Smokeless furnace ..... C. J. Dorrance  
Soap holder ..... E. F. Wach  
Spacing apparatus ..... R. J. Davis  
Spade ..... F. Ritter  
Spade shield, Military ..... C. Wiener  
Spectacle temple ..... P. Peck  
Spike puller ..... E. Woodings  
Spinning and twisting frame flier ..... J. H. Young  
Spool, Jack ..... L. T. Houghton  
Sprayer, Liquid ..... L. A. Aspinwall  
Sprinkler head, Automatic ..... N. L. Danforth  
Sprocket wheel for toothed drive chains ..... J. M. Dodge  
Stamp affixer ..... S. Lewellen  
Stamp mill, Ore ..... T. E. Lambert  
Stamp, Printing ..... W. Laycock  
Stapling mechanism ..... J. C. F. Balze  
Steam engine ..... W. R. Emerson  
Steam meter ..... W. A. Kitts  
Stenographic machine ..... L. Chambonnaud  
Stirrup, Safety ..... W. P. McFadden  
Stock and die ..... N. Tobias  
Stoker ..... H. G. Cox  
Stone dressing machine ..... F. Carman  
Stone fronts, Making imitation ..... E. G. Kemper  
Stone working machine ..... J. R. Peirce  
Stopper extractor ..... A. Seitz  
Stopping device and alarm, Automatic ..... D. B. Adams  
Storage cells, System for charging ..... A. G. Wilson  
Stove or furnace, Heating ..... R. L. Commons  
Stovepipe fastener ..... L. A. Lowe  
Straw spreader ..... O. Frack et al  
Stuffing box ..... A. J. Jeron  
Sugar from bagasse, Recovery of ..... C. C. Cromwell et al  
Sulfur trioxid, Making ..... H. S. Blackmore  
Swing, Lawn ..... F. W. Williams  
Switch key ..... E. B. Craft  
Switch operating and locking device ..... A. Anderson  
Swivel burner ..... B. A. Baxter  
Tablet or book divider ..... A. E. Edmondson  
Tack pulling machine ..... F. Chateanneuf  
Tag, Return shipping ..... C. R. Williams  
Target trap ..... L. A. Sherman  
Telegraphy ..... I. Kitsee  
Telegraphy, Submarine ..... I. Kitsee  
Telephone apparatus ..... K. Kohn  
Telephone apparatus ..... C. A. Bucklin  
Telephone exchange, Automatic ..... C. D. Enochs  
Telephone exchange system ..... C. E. Scribner  
Telephone party line system ..... H. B. Stocks  
Telephone system ..... E. R. Corwin  
Tension device ..... G. W. Foster  
Threshing machine ..... B. Cook  
Ticket, Duplex railway ..... J. F. Ohmer  
Ticket or tag ..... T. H. O'Brien  
Tire ..... J. H. Swain  
Tire, Cushion ..... E. B. Cadwell  
Tire, Pneumatic ..... H. D. Lefferts  
Tire rim, Detachable ..... H. G. Leisenring  
Tire, Rubber wheel ..... H. G. Osburn  
Tires, Means for inflating rubber ..... A. G. Lavertine et al  
Tobacco cutter ..... J. W. Sherwood  
Tool holder ..... W. A. Garrigus et al  
Toy ..... W. S. Cooper  
Traction engine ..... L. G. Dix  
Triangle, Draftsman's ..... G. C. Noble  
Trolley ..... G. C. Thomas  
Trolley wheel, Self-lubricating ..... T. Bednarowicz  
Trousers pad ..... A. Warshawer  
Trousers stretcher and presser ..... M. E. Weisehan  
Trucks, Friction grip for roadway ..... S. Carlson et al  
Truss ..... S. A. Donnelly  
Tub cleaner ..... T. Andrews  
Tube cutter ..... L. T. Jones  
Tube scraper ..... G. H. Burpee  
Tug, Trawl ..... B. F. D. Miller  
Turbine engine ..... E. F. Prall  
Type casting machine, W. A. Schraubstadter  
Type casting machine ..... H. S. Wilson  
Typewriter variable spacing mechanism ..... N. G. Ellis  
Typewriting machine ..... H. A. Briggs  
Typewriting machine ..... W. F. Helmond  
Typewriting machine ..... E. F. Kunath  
Typewriting machine ..... G. M. Kitzmiller  
Typewriting machine ..... H. A. Sanderson  
Valve ..... J. Bowers  
Valve ..... J. F. McElroy  
Valve ..... W. P. Firey  
Valve, Globe ..... H. Kieren  
Valve, Pressure reducing ..... L. Schutte  
Valve protector ..... R. F. Lindsay  
Valve, Radiator ..... B. E. Van Auker  
Valve, Safety stop ..... C. W. Nicholson  
Valve, Steam boiler blow off ..... J. Klopfer  
Valve, Steam engine rotary ..... J. G. Johnson  
Varnishing and gumming machine ..... M. J. McCaffrey  
Vault, Burial ..... H. C. Deck  
Vehicle, Motor ..... A. Weiss  
Vehicle spring ..... R. E. Hardesty  
Vehicle steering gear, Self-propelled ..... J. H. Taylor  
Vehicle storm top ..... L. Horner  
Vehicle umbrella or canopy support ..... H. L. Johnston  
Vehicle wheel, Road ..... G. Middleton  
Vehicle, Wheeled ..... S. G. Whitehouse  
Ventilating plate ..... J. D. Riggs  
View holder ..... T. F. Charlton  
Wagon box, Metal ..... P. Kief  
Wagon, Dumping ..... C. J. Handel  
Wall covering, Metallic ..... J. S. Patterson  
Wardrobe, Portable ..... G. M. Russeque  
Washboiler ..... A. R. Prichard  
Washing machine ..... G. R. Adams  
Water closet seat ..... L. & F. L. Kramer  
Water cooler ..... S. S. Montanye  
Water motor ..... P. M. Melton  
Weighing machine ..... H. Richardson  
Weight operated gate ..... A. C. Worland  
Welding, Electric ..... L. S. Lachman  
Wells, Derrick for pumping oil ..... G. E. Keeler et al  
Window ..... W. H. Barriere  
Window ..... G. W. Baffington  
Window fastener ..... G. S. Lord et al  
Window, Pivoted ..... O. A. Essig  
Window screen, Roller ..... C. F. Barr  
Windows, Mechanical moisture wiper for show ..... H. Reimers  
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Carpet fastener, Stair ..... L. A. London  
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Cleaning, Dry ..... J. Doux  
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Clothing hanger and clamp, Combined ..... F. Thompson  
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Constructional sections. Making G. Atterbury  
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Conveyer. C. K. Baldwin  
Conveyer. L. Moss  
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Core making machine agitator J. S. Nicholsen  
Corner fastening. C. E. Springer  
Corner fastening. L. B. Prahar  
Cotton chopper. J. B. Clark  
Cotton gin. W. H. Kent  
Cotton gin breast hinge. W. K. Stone  
Couches, davenport, &c. Handle for box W. P. Seng  
Crate. Display. W. H. Thomas  
Crate. Folding. C. Smith  
Cream cooler. C. C. Hills  
Cultivator. A. Lindgren  
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Current motor. G. A. Larson  
Curtain hanger and support. G. W. Powell  
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Dam. G. E. Ladshaw  
Dandruff, &c. Apparatus for removing. M. Strunsky  
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Diseases by light. Cabinet for treating B. F. Fuller  
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Door construction. Sliding. J. R. Hussey  
Door holder. J. Becker  
Doubletree. Three horse. C. W. Spangler  
Drawing apparatus. S. H. Donaldson  
Drive wheels. Traction attachment for W. A. Klingberg  
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Dust. Method of and agent for laying. C. E. Dolbear  
Egg separator. C. D. Herrick  
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Electric switch. G. W. Hart  
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Electrically operated indicator. M. C. Regan  
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Elevator guard. W. P. Conolly  
Elevator safety device. E. Dunkerley, Jr.  
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Ellipsograph. J. W. Becker  
Embroidering machine. V. Kobler-Stander  
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Evaporating apparatus. J. A. Warren  
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Signal systems. Automatic train stop for block. F. B. Corey  
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Stereotypes and other plates. Mounting board for. C. Smith  
Stool. Pneumatic cushioned. J. F. Heister  
Stove. J. F. Heister  
Stove grate. Cooking. T. J. Hammer  
Strainer. W. F. Cook  
Suit hanger. A. Lokvitch  
Superheater retort. P. Meyer  
Suspensory. M. B. Hirsch  
Switch frog. W. J. Eicher  
Switch point thrower. H. T. Cline  
Take up. Double recoil. F. Knight  
Talking machine sound box. E. R. Johnson  
Talking machine sound box. J. C. English  
Talking machines. Sound box with coupled diaphragms for disk. L. Gady  
Tank and pot furnace. Combined. J. A. Chambers  
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Telegraphy. Receiver for wireless. W. Schloemilch  
Telephone exchange system. H. O. Rugh  
Telephone exchange system. Party line. A. O. Stigberg  
Telephone exchange systems. Register signal for measured service. F. R. McBerty  
Telephone switchboard. A. M. Hanbrich

Telephone system. H. G. Webster  
Telescope. G. N. Saegmuller  
Tent stake. A. Rounsburg  
Testing device. C. Wagner  
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Tile. Furnace. J. F. Warwick  
Timber clamp. Cross. W. London  
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Tow brakes, &c. Feeder for. T. Hobans  
Towel holder or cabinet. H. C. McDonald  
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Turbine. Elastic fluid. J. C. & H. A. Prescott  
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Umbrella. Folding. F. E. Hvatt  
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Valve. Indicating. A. J. Stahl  
Valve operating mechanism. G. W. Hayden  
Valve or stopper. C. W. Meinecke  
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Vehicle. M. I. Dawkins  
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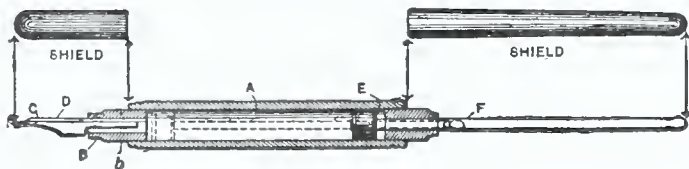


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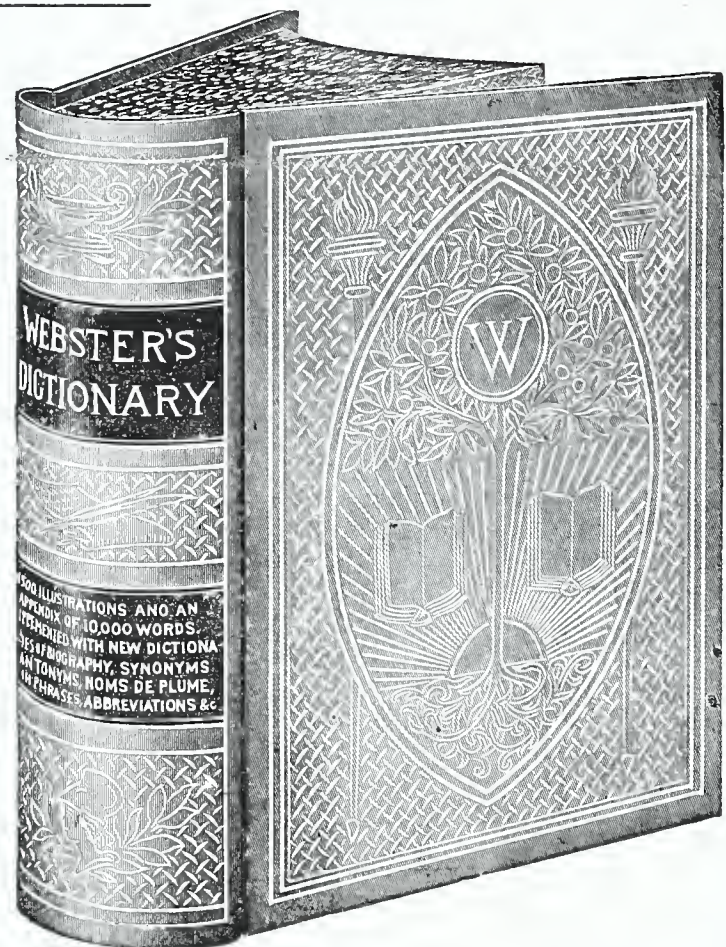
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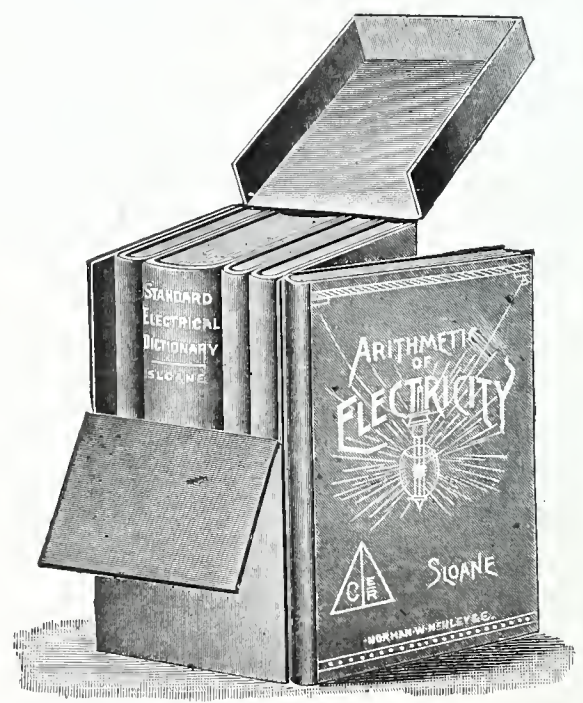
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MEDITERRANEAN SEA FROM PORT SAID SHOWING BREAKWATER AND STATUE OF DE LESSEPS.

WHAT was only a small part of the Libyan Desert thirty-five years ago is now the city of Port Said, purely an artificial town. As cities of our west have been founded by the railroad, so Port Said has come into existence because of the Suez Canal. Previous to 1860, it was only a continuation of that desolate coast of northern Africa washed by the Mediterranean.

Port Said is the northern entrance to the great Suez. All ships from Africa and Europe bound for India, China or Australia, when taking the Mediterranean route, must of course stop here to await their turn for passage into the Red Sea. By means of two breakwaters running into the Mediterranean, this port has been converted into an ideal harbor; these sea walls serving to

break the force of a heavy sea and also acting as a preventive in keeping sediment, which is constantly discharged by the Nile, from clogging the entrance to the Canal.

On arrival, the traveler is more than likely to be aroused from the lethargy in which he indulged while on the Mediterranean, by the screaming and puffing tugs which are winding in and out among the ships at anchor; dredges with their harsh sounding chains are constantly at work cleaning the bed of the bay and add to the noise; colliers with their swinging derricks are making desperate efforts to diminish their load; steamers destined for long runs are having their bunkers filled by an endless procession of Arab coolies who



carry baskets of coal on their heads like our southern Negroes, forgetting the burden for the time being by singing, each a separate song, which when taken together produce a noise not easily forgotten. These coolies can coal a ship at the rate of two hundred tons an hour.

In addition to having the reputation of being the most evil city in existence, Port Said is the most cosmopolitan, for here can be found the homes of all nationalities from the half civilized Hindoo to the well cultured Englishman. The census when last taken showed a population of 10,000. Their means of subsistence is derived from the traveler chiefly; they sell curios of all descriptions, ostrich plumes, boas, fine embroidered shawls and kimonas, books containing pressed flowers supposed to have been grown on the Mount of Olives; hand-made rugs, Egyptian cigarettes, and hundreds of other things, all worth about one-tenth the first asking price.

The city is, when compared with those of the east, comparatively clean. There is, however, the usual drawback, the slums or Arab town. In this section the coolie element is corralled, many families living in a single hut.

The sight which attracts the attention of the stranger as being particularly novel is the masked Egyptian woman, whose full face is never seen outside of the immediate family. She never appears on the street unless wearing her veil.

For subsistence Port Said relies entirely upon what is brought from other parts of Egypt and by ships from foreign countries. The surrounding land is naturally unfit for agricultural purpose, and artificial methods are quite impossible for the reason that there is no source for irrigation.

The streets of the city are entirely of sand excepting, of course, the very

important ones which have a layer of crushed stone thrown over them in order to make their road bed permanent. Those that have not this protection are being constantly worn into ruts and gullies, and consequently require filling to keep them to a proper level.

but are generally wide enough to permit the shop keeper to make a grand display of his goods to the passer-by. In fact it is just here that Port Said holds the secret of its quaintness. All along both sides of the streets, and particularly along the picturesque quay, the native bazaar keepers have

early evening the inhabitants, other than the native element, seek relief by taking a siesta under the crudely-made but cooling fan called the punka, which the native operates by pulling with his legs while he too lies down.

Steamers as a rule make only a brief stop, and the few sights of in-



SUEZ CANAL.

To further add to the barrenness of the place, the city is entirely without trees excepting only a few that have been brought from other places, and these few are given the most careful attention; but with even this care they attain no considerable height.

The sidewalks are on the same level as the roadways, and are little, if any, better paved. They vary in width,

their awnings spread to completely shade the fronts of their shops, and as the whole town has only these stores for its business, the general effect is one of a city under a great tent to protect it from the burning sun.

Rain seldom falls and with nothing to ever off-set the heat as it is reflected from the sand, the days are so exceedingly warm that from noon until the

terest have to be seen hurriedly: they are the statue of Ferdinand de Lesseps; Office of the Canal Company, Arab town, Exchange Building, the mosques, and the lighthouse, a building over 180 feet high. If you have the necessary time, a trip to Jerusalem which is only 175 miles away, or a trip on the desert by rail to Cairo, and more natural still, a ride into the desert on the camel, are well worth the trouble.

## WIRELESS SUBMARINE SIGNALS.

France leads the world in the construction of submarine vessels. While other countries have been spending millions in building warships and armored cruisers, the French admiralty has devoted its attention chiefly to these small submergible boats. How many the government owns is a state secret. They are referred to as torpedo boats in the treasury estimates, and reporters are not invited to witness experiments and trial runs. It is nevertheless known that remarkable results have been obtained with these tiny vessels. A device for seeing under water has been perfected; submarine telephones are found to work satisfactorily, and the latest is the news that a French engineer has invented an apparatus by which torpedoes can be fired under water at a distance of several miles.

The submarine telephones will doubtless be put to use in the next naval war. They will be employed for communicating with torpedo boats, as well as for detecting the presence of the latter class of vessels belonging to an enemy. For the former purpose, an instrument called a multiple sounder has been constructed. This has an alphabetical keyboard re-

sembling that of a typewriter, a pressure on a key causing a set of hammers to beat on a diaphragm the Morse telegraph sign for each letter. Any one who can operate a typewriter can in this way send a submarine message. A special apparatus somewhat like a stock ticker would enable the message to be picked up on a submarine boat, and printed on a tape. In the same way a message could be sent from the submarine boat and received at a shore station, or on a flagship of a fleet. An even simpler method of sending messages would be by attaching a striking gong or bell to the side of a ship and tapping out a certain code, already agreed upon.

It has been known for some years that electric waves could be utilized to explode torpedoes at a distance, as well as to light incandescent or arc lights, and to set electric and steam motors in motion. This wireless transmission of power to mechanical objects represented a great step forward in the line of progress; but the drawback to this invention has been the mast or pole, designed to collect the waves and transmit them to the receiver. This pole varied in height according to the distance separating the point of emission from the point of reception, and regulated the motion desired or the intended explosion. The pole when used for the explosion of torpedoes became necessarily an indication of danger, and thus destroyed the efficacy of an explosive by revealing its existence. The receiving machines are also rather complicated, difficult to trans-

port, easily put out of order, and expensive.

Armed with the knowledge of this discovery, as described, and keeping its disadvantages in mind, Jean Denissel, an electrical engineer of Roubaix, has succeeded in producing an apparatus for receiving electric waves that is highly sensitive and precise, a machine that works under ground and in water, at a long distance from the transmitter of electric waves, and requires no mast or pole. This apparatus costs to manufacture only about \$10, is easy to transport, and is not readily put out of order. It weighs about seven pounds, and is cubical in shape.

The invention rests upon the application of a connector, which does away with the relay necessary to poles for the reception of wireless telegrams, as now in use. The importance of the discovery will be realized from the fact that it can explode a torpedo under a vessel at a distance of several miles. There will no longer be any necessity for fishing up floating torpedoes, or for avoiding those that have been sunk; nor will there be any occasion to cut wires connected with them. No matter where explosives provided with the Denissel invention may be placed, no power can prevent their explosion at the moment decided upon by the person manipulating the machine which regulates the wave emissions. The new device is applicable also to the direction and firing of automobile or Whitehead torpedoes. It is well known that half of the torpedoes projected in active war

miss aim either through faulty throwing or deviation. The Denissel invention allows for throwing them in any direction, even backward. Even if a torpedo be caught in the nets with which warships are now provided, it will explode and cause great damage.

The new device can also be utilized on land. It can set into motion, from a long distance, electric machines or steam motors; illuminate lighthouses; and even start a typewriter, so that this will print a long way from the post of emission of the message.

The French minister of the navy, on hearing of this marvelous invention, delegated a lieutenant to investigate its working. In order to demonstrate that the device can work at a long distance and without poles, Mr. Denissel, taking one of his machines, accompanied the lieutenant on a train going from Arras to Paris. Before leaving Arras, the lieutenant was requested to give a note to the person manipulating the waves of emission, that should indicate the hour when the machine was to explode. At the moment chosen when the train was about twenty-five miles from Arras, the apparatus exploded before their eyes, through the agency of waves sent from the latter city.

But the most sensational invention in the submarine line is the device for providing sight for the men in the immersed vessel. Submarine boats, it is generally known, have a vertical telescopic tube, resembling a very thin smokestack, which extends some dozen feet above the bridge. Its top part contains the so-called eye, which sends



## INDUSTRIAL DISPLAY A FEATURE AT THE JAMESTOWN EXPOSITION.

By A. S. KELTON.

down images of the outer world to the interior of the boat, either by reflection or refraction. This has been found to be so unsatisfactory that it has been one main drawback to the use of submergible vessels. As a Frenchman put it, the periscope is like glancing at the world through a pin-hole. The reflection apparatus has two mirrors, at 45 degrees at the two extremities. The device for refraction has prisms, similar to those in a camera. Behind the top one a mirror sends down the image to the lower prism. It has the advantage of giving an image that can be enlarged, like the telescopic attachment to a camera; but it is very crude in its working. Suppose the eye be fixed north. Those in the submarine get a glimpse due north; to glance a few degrees on either side the whole tube must be turned, when the image turns. With it the observers have to move around the table. Or, if the eye alone be turned, the lower prism remains fixed, so that all objects are inclined at the angle of the eye's turning.

It is obvious that to make the submarine really efficient, it was necessary to find a device that would disclose simultaneously the whole circle of the horizon, plus a telescopic magnifier to enable the object to be carefully examined. This, it is claimed, has been discovered, and is now being applied to French boats. The construction of the apparatus is of course surrounded by mystery, but it is known that it was found through efforts to utilize an annular prism devised for taking circular photographs of the horizon from a captive balloon.

Equipped with this new instrument, the submarine boat remains on the surface until within a mile of its prey. At that distance, it resembles a simple torpedo boat. It then sinks and navigates under about six feet of water. Some 800 yards from the doomed ship, the telescopic tube is pulled in, and navigation is continued by the aid of the compass. At a distance of about 300 yards the torpedo is fired, with destructive results.

Whether these new inventions accomplish all that is hoped by the French admiralty, it is certain that fighting under water will form an important feature of the next great war. France has a large number of these vessels, from 100 to 200 feet long, furnished with both steam and electric engines. All details of their construction are kept secret, but it is understood that their normal plane of travel is on the surface, and that the steam engines run the dynamos to renew the motive power of the electric engines. There are also boats less than fifty feet in length, provided with electric engines, intended to be carried on cruisers for offensive operations.

Germany has voted over a million dollars for submarine construction this year. England, too, is giving increased attention to the subject, her boats being mainly of greater displacement than those above described, so as to have a wider radius of action. It is firmly believed in France that it was a Japanese submarine flotilla that destroyed the first Russian fleet, and that the same tools were used in the second naval battle. However this may be, before many years the navy of every country of importance will include a submarine fleet.

### Use for Old Belting.

The value of the razor strop lies in the fact that the grain of the leather must not run one way. Old belting that has been in use for a couple of years and subjected to an enormous pulling power during that time makes an excellent strop, provided it is not too oily. Many razor manufactories get their leather by buying up old belting.

ONE of the most interesting features of the Jamestown Exposition, to be held on the shores of Hampton Roads in 1907, will be the comprehensive illustration of the industrial growth of our country, during the three hundred years of its existence. To this end the exhibits of manufactures, industries and inventions, will be selected, and the visitor will be greatly impressed with the graphic representation of the growth of the nation, from its humble beginning through the various stages of its development, to its present grandeur.

Owing to the fact that within a radius of twelve hours ride of the Exposition grounds, there are 21,000,000 people, and within twenty-four hours ride there live 40,000,000 people, it is an assured fact that the total attendance of the Ter-Centennial will at least amount to from 10 to 15 millions. The value to exhibitors of this immense attendance has been recognized and appreciated by every one interested, and it is expected that the industrial display of the Jamestown Ter-Centennial will successfully rival that of the Pan American Exposition.

The Industrial display will be classified in such groups as Manufactures and Liberal Arts, Machinery, Transportation, Mines and Metallurgy, etc. Under the head of manufactures will be exhibited hardware, furniture, watch and clock making, textiles, and many others. Under the head of machinery will come a great display of steam engines, various motors, general machinery and machine and arsenal tools. So on down under the various departments will be exhibited all the industries of the country, in a concise and intelligent way.

Colonial Arts and Crafts are to be reproduced at the Exposition in an old time village built for that purpose. The village will comprise eight or nine buildings of colonial architecture in which metals, woods, and fabrics will be wrought by the methods of the early colonists. The various kinds of metal workers will each have their own building and the objects of their inventive genius will be turned out day by day. Wood workers will build chairs, tables, beds, bureaus, washstands, and bookcases, in fact all articles of furniture. There will be a building for the display of textiles where carpets, rugs, shawls, blankets, table covers and towels will be produced, every process of the manufacturing being shown. This "Village of Arts and Crafts" will recall the past in a most interesting and instructive way, and will also afford a splendid comparison between the old colonial methods and our present day industries.

The buildings provided to house the exhibits of manufactures, machinery and transportation, will be immense in size and beautiful in construction. There will be two splendid buildings of twin proportions, containing 130,-

000 square feet of exhibit space each. One of these will contain the general manufactures and liberal arts, the other, machinery, electricity and transportation, including motor and power devices. Beside these two main buildings there will be a "Village of Arts and Crafts" already spoken of, a Pure Food Building and a Hall of Invention. The Pure Food Building, an innovation in the former customs of exhibit work, will be a structure built on the colonial style of architecture. Here will be held lectures, demonstrations and other methods showing the wonderful effect that food has on the country at large, in fact its effect on the entire sociological system.

The Hall of Modern Inventions will also be a feature of novel interest to the visitors of the Ter-Centennial. The plan proposed provides for the erection of a special building to be devoted to the exhibition, exploitation and demonstration of the working of inventions of every description.

At all previous expositions, inventions, however worthy and valuable they might be, were refused admittance under the rules, unless they were being manufactured or were on sale. It is believed that many valuable inventions, superior to those of like character now in use, are in the hands of inventors, who for various reasons, are unable to develop them successfully, and many useful inventions are lost to the world on this account.

With a special building devoted to inventions of this character, inventors or their representatives can make a demonstration of their invention's value, and in most instances could interest visitors and often secure the aid of capital for development purposes.

The customary rules and regulations, governing great expositions, with some improvements in the interest of the exhibitors, have been adopted. A system of awards will be inaugurated and will receive careful consideration, jurors being picked out for their integrity and high character.

While the industrial display will be of a national character and carried through on extensive lines, nevertheless only a limited number of exhibits in each line of industry can be admitted. It will therefore become the only "selective exposition" along these lines, that has ever been held in America, and will show the progress and highest attainment in every department of industry.

### Cleaning the Air.

The effect of a thunderstorm in bringing clean air has been observed by everyone, but the process is not so generally understood. A meteorologist was making observations with his dust counter on the Eiffel Tower, at Paris, during a recent heavy shower, and he remarked that while before the rain the number of dust particles was large, showing that the impure air of the city was rising in quantities, all

disappeared after the storm. In fact, the air became as free from dust as any that the observer had ever tested on the mountain tops of Switzerland. This increase in purity he ascribes to the dragging down of the upper air to the level of the top of the Eiffel Tower, for the reason that "rain cannot wash the air to anything like that purity."

### A Copyright Decision.

A rather peculiar decision on copyright was recently handed down by Judge George C. Holt, of the United States District Court in New York City. It has been the custom of large concerns, seeking for attractive illustrations for advertising, to reproduce famous or beautiful paintings. This is especially true of tobacco and cigarette makers. Under the assumption that a copyright notice must appear on copyrighted articles to protect them against reproduction, many great paintings have been reproduced by lithograph houses and sold to advertisers.

Last winter a painter, Emil Werckmeiser, brought suit against the American Lithograph Company and the American Tobacco Company for infringing his copyright by using a reproduction of one of his paintings. The defense was that no copyright notice appeared on the painting and the defendants had no means of knowing whether or not the painting was copyrighted; but the court decided that, in the case of paintings and sculpture, no notice was required to protect the works of art against piracy. It would be interesting to know whether this decision covers photographs and similar works of arts. However that may be, it behooves picture makers and advertisers to be careful in taking liberties with other people's productions. They may be loaded.—*Pure White*.

Manufacturers of the United States who have any thought of exporting their goods to Cuba should register their trade-marks in that country at once, as the only method by which they may protect themselves. If owners do not register their marks, others will; and the owners will then be compelled to buy out the speculator if they wish to sell their own goods under their proper names. When once registered by speculators, the real owners of trade-marks are at a great disadvantage, and must either by paying royalties or direct purchase, buy up the speculators. The Habana Chamber of Commerce, recognizing the great injustice that is being done in this way, is urging foreign manufacturers in their own behalf to register their marks before others do so, and thus practically confiscate their property. The dues charged in Cuba for the registration of a trade-mark are \$12.50 United States currency.—*Daily Consular & Trade Reports*.

### Curved Elevator Shaft.

In a Boston subway station there are elevators that do not go straight up and down, yet maintain a level floor while passing through a curved tube. This is effected through the agency of curved guides, which hold the elevators at an exact level, so that the passenger thinks he is traveling in a vertical direction unless he looks out through the iron lattice work and notes the crooked lines of the shaft.

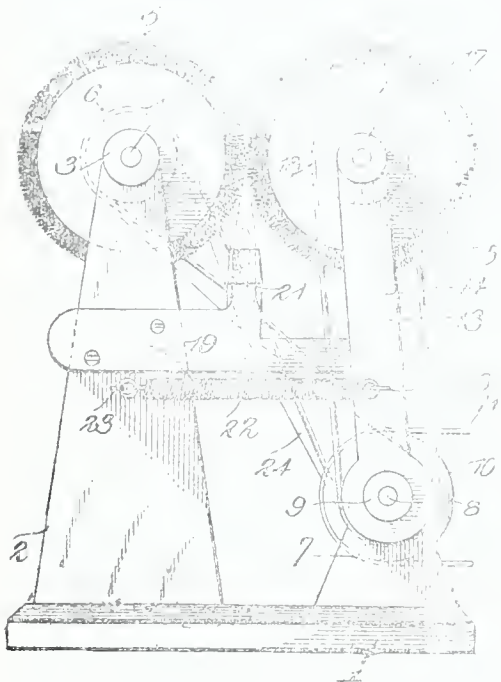


## CLEVER NEW PATENTS.

Machine for Removing Scales from Axes.—  
Jar Sealing Wrench.—Ironing Table.—  
Push-Button.

### Machine for Removing Scales from Axes.

In the manufacture of axes and other steel tools, it is customary to remove the scale of oxid formed thereon by means of grinding, or by the use of steel brushes operated by hand. Neither of these modes of procedure is satisfactory, because the former is difficult to perform evenly, and the



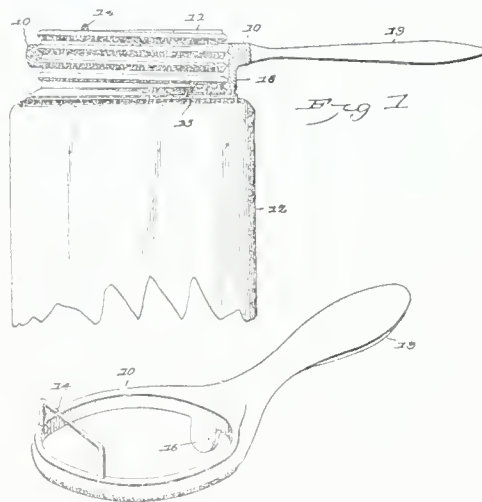
latter is slow and laborious. Mr. Elmer P. Alexander, of Yeagertown, Pa., has devised a machine, which he claims will remove the scale, particularly that formed upon axes, almost instantly and in a uniform manner, and without the employment of skilled labor. The patent obtained thereon has been assigned to Mr. James H. Mann, of Lewistown, Pa. The machine, as shown, consists of a pair of rigid standards 2 on which is mounted a rotatable brush 5. A swinging frame 13 carries another rotatable brush 17 that coacts with the first-named brush. A spring 22, connecting the standards and frame, serves to hold the brushes together, and a work support 19 21 is arranged beneath the brushes, and is secured to the standards, the support having means to limit the movement of the swinging frame toward the standards. Motion having been imparted to the brushes by means of the driving devices, the removal of scale from an ax will be accomplished by merely passing the ax butt downward between the rapidly-revolving brushes 5 and 17, and bringing the butt in contact with the guide formed by the extension 21 of the member 19, then drawing the ax forward and downward along the incline of the guide. If all of the scale is not removed at a single operation, it may be seen at once, and the operation may be easily

repeated as often as may be necessary to effect the complete removal of the scale.

### Jar Sealing Wrench.

The sealing flanges of fruit-jar covers frequently become buckled or irregular in outline from various causes and require straightening to enable them to bear with requisite uniformity upon the sealing gaskets or bands to prevent the entrance of air, or the escape of the gases. To provide a simple and efficient tool whereby such irregularities in the flanges may be readily corrected, after the covers or caps are in position upon the jars and with the sealing gaskets between them, is the object of the invention devised and patented by Luceons D. Burlingham, of Warren, Ohio.

The two figures show first the device applied to a jar and then detached. The implement comprises a ring portion 10 for encircling the cap 11 of a fruit jar, and a handle extending radially therefrom. A transverse bar 14 is spaced from the ring portion and extends over the jar cap. Depending from the ring portion is a presser lug 16 for bearing upon the flange 15 of the cap.

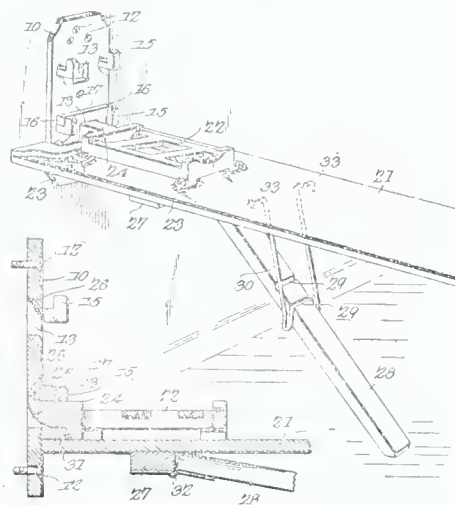


In operation, the ring 10 is placed over the cap, with the bar 14 resting upon the cap and the lug 16 bearing upon the sealing flange. As the implement is rotated with a strong downward pressure, the lug 16 will firmly and uniformly compress the flange 15, and remove all irregularities and insure a corresponding uniformity of pressure upon the flexible sealing gasket.

### Ironing Table.

A novel ironing table having several unique features has been patented by Mr. William Henry Harrison Marcum, a well known resident of Lees Summit, Mo. As shown in the accompanying illustration, a wall or stationary supporting plate 10 is employed, and is provided with two apertures 13 (one above the other,) and upwardly extending hooks 15, arranged on opposite sides of the apertures. The ironing board 21 has a

flat-iron stand 22 secured thereto at one end, and this flat-iron stand is provided with a lug 24 that detachably engages in one of the apertures, and has an upstanding lip 25 at its inner end. A transverse plate 17 is provided with an opening 18 that registers with the aperture 13 of the stationary plate, and has oppositely extending lugs 16 that engage with the hooks 15. A supporting leg 28 is hinged, as shown at 27, to the board, and a brace or stirrup 30 has a hinged connection with the board and engages in notches 29 in the leg.



By this simple means the table or board 21 may be quickly connected to, and disconnected from, the plate 10 and firmly locked in position relative thereto, unless tilted up by its free end into a position it would not be caused to assume while in use.

The distance apart of the apertures 13 represents the difference in height which the board 21 is required to be placed to accommodate different-sized persons using the board.

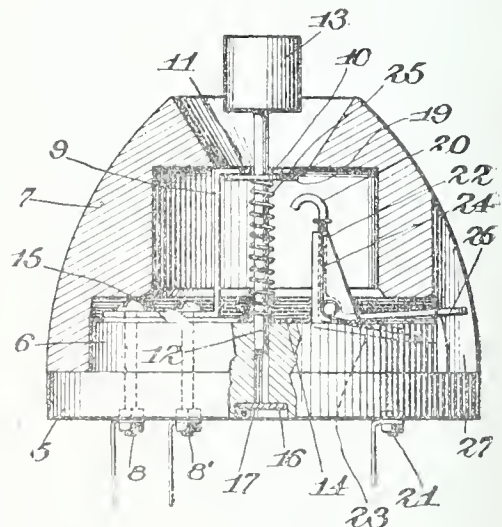
The plate 17, with its attachments, forms an important part of the improved device, as by this means the board or table is firmly supported and held from lateral or swinging motion, and lateral strain upon the stud 24 reduced.

### Push-Button.

A novelty in the line of push buttons or circuit closers has been patented by Mr. Edward Brusseau, of Jefferson, S. Dakota. The principle object is to provide a simple, inexpensive and efficient device of this character that is particularly designed for use in hospitals and similar institutions, and by means of which a patient may ring a signal bell, and at the same

time cause an incandescent lamp or other signal to be displayed, thereby indicating to the attendant the location of the person sending in the call. The invention consists broadly of a push button that includes a plurality of contacts, and means for locking one set of contacts in circuit closing position. The contacts moreover are arranged to be successively closed by the movement of the button, such button having a terminal that engages therewith. The button comprises a base 5, to which a supporting bracket 9 is secured. A pin 12 is provided with an intermediate contact 10, and a terminal contact. The pin is slidably mounted on the bracket. A manually operated locking lever 26 is provided for locking the intermediate contact in circuit closing position, and a cup or cover fits over the base and encloses the above described mechanism, being provided with a socket 27 that receives the handle 26 of the locking lever.

In operation when it is desired to ring the bell, the push-button is depressed, the inward movement of the contact-pin causing the disk 19 to engage the hooked end of the lever 26 and tilt the latter, thereby permitting the disk to pass and the end of the pin to make contact with the plate 16.



When the button is released, the tension of the coil-spring will force the disk in contact with the end of the locking-lever 26, thereby closing the lighting-circuit and causing the visual signal to be displayed. In order to break the lighting circuit, the locking-lever is depressed, permitting the coil-spring to return the push-button to its normal position.

## PATENTS, CAVEATS, TRADE MARKS, COPYRIGHTS, AND DESIGNS. TWENTY-FIVE YEARS PRACTICE.

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## LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

**AMERICAN CAN CO. v. MORRIS et al.**  
(Circuit Court of Appeals, Seventh Circuit.  
142 F. R. p. 166.)

**PATENTS—INVENTION—LOCK-SEAM RIP-STRIP CANS.**

The Norton patent No. 539,366, and the McDonald patent, No. 543,341, each for a lock-seam can having a rip-strip, are void, both for lack of invention and for prior use of the device by another in this country.

**FERRY-HALLOCK CO. v. HALLOCK et al**  
(Circuit Court, E. D. Pennsylvania. 142 F. R. p. 142.)

**1. PATENTS—INFRINGEMENT—CHANGE OF FORM.**

Where the whole substance of an invention—that which entitled the inventor to a patent—may be copied in a different form, it is the duty of the courts to look through the form of an alleged infringing device for the substance which the patent was designed to secure, and where that is found there is infringement.

**2. SAME—MACHINE FOR MAKING HAT PACKING RINGS.**

The Ferry patent, No. 523,833, for a machine for automatically making pasteboard strips for hat packing rings, while not a pioneer patent, was not anticipated and discloses patentable invention, the machine being a marked improvement in utility over those of prior art, also held infringed.

**HOSTETTER CO. v. GALLAGHER STORES.**  
(Circuit Court, S. D. New York. 142 F. R. p. 208.)

**1. EVIDENCE—OPINION EVIDENCE—COMPETENCY OF WITNESSES—EFFECT OF EVIDENCE.**

The testimony of witnesses who from experience were entirely familiar with the color, taste, and smell of certain bitters that a liquid sold by defendant by that name was not such bitters, but was an imitation, is competent, and, where not directly contradicted, and corroborated by the circumstances, is sufficient to establish the fact.

**2. TRADE-MARKS AND TRADE-NAMES—NATURE OF UNFAIR COMPETITION—SALE OF IMITATION FOR GENUINE ARTICLE.**

Evidence showing that defendant, which conducted 20 stores, advertised in its general catalogue to supply to its customers Hostetter's Bitters without limit as to quantity at a price only two-thirds of that at which such bitters are sold by complainant, the manufacturer, and that defendant did supply to its customers calling for such bitters an imitation, sometimes, when desired, placing the same in complainant's bottles, but without using its labels or trade-mark, sufficient to establish unfair competition and to entitle complainant to an injunction and an accounting.

**ROBINS CONVEYING BELT CO. v. AMERICAN ROAD MACH. CO.**  
(Circuit Court, E. D. Pennsylvania. 142 F. R. p. 221.)

**1. PATENTS—INFRINGEMENT—SUBSTITUTION OF EQUIVALENT PARTS IN COMBINATION.**

Infringement of a combination patent is not avoided by the substitution for one of the parts of the patented machine, which consists of a pulley revolving on a shaft, of a pulley having tucnions revolving in bearings at the ends; the two devices being exact mechanical equivalents.

**2. SAME—IDLEERS FOR BELTS.**

The Robins patent No. 571,604, for a troughing idler, was not anticipated, and discloses invention; also held infringed.

**DODGE MFG. CO. v. SEWALL & DAY CORDAGE CO.**

(Circuit Court, D. Massachusetts. 142 F. R. p. 288.)

**1. TRADE-MARKS—REGISTRATION.**

The registration of a trade-mark by a rope manufacturer, consisting of a colored thread twisted in one of the strands of the rope, had no legal effect except to indicate that such manufacturer claimed the trade-mark set forth in its application at the time of the registration.

**2. SAME—SCOPE OF TRADE-MARK.**

Where a rope manufacturer adopted a blue thread twisted into one of the strands of its rope as a trade-mark, which was the only practicable way of marking rope,

such manufacturer was not entitled to restrain another manufacturer from using a thread of a different color.

**A. LESCHEN & SONS ROPE CO. v. MACOMBER & WHYTE ROPE CO.**  
(Circuit Court, N. D. Illinois, E. D. 142 F. R. p. 289.)

**TRADE-MARKS—VALIDITY—COLORED STREAK IN WIRE ROPE.**

A registered trade-mark, described as consisting of "a red or other distinctly colored streak applied to or woven in a wire rope," is invalid, not only because there can be no valid trade-mark in color alone, but for the further reason that it contains no distinctive design, but attempts to monopolize the right to use any streak of any color, however produced in or applied to a wire rope.

**DAYLIGHT GLASS MFG. CO. v. AMERICAN PRISMATIC LIGHT CO.**

(Circuit Court of Appeals, Third Circuit. 142 F. R. p. 454.)

**1. PATENTS—INVENTION—PRESUMPTIVE KNOWLEDGE OF PRIOR ART.**

In determining the question of patentable invention, a patentee is chargeable with knowledge of all that preceded him in the art.

**2. SAME—MACHINE FOR MAKING PRISMATIC GLASS.**

The Cummings patent, No. 695,282, for a machine for making prismatic glass is void for lack of patentable invention in view of the prior art, and especially of prior machines for making corrugated glass, which contain all of the elements of that of the patent and operate in the same manner. The Cummings process patents based thereon, Nos. 699,283, 699,284, and 719,404, are also void.

**3. SAME.**

A machine for rolling prismatic glass previously made by molding, which contains the same elements and operates in precisely the same manner as prior machines for rolling corrugated glass, is not given patentability by the fact that it has been a commercial success and that its use has resulted in a better and cheaper product, where the only reason prism glass was not before so made was the general but erroneous belief among glass manufacturers that it would be worthless, because it could neither be cut nor properly annealed.

**FORSYTH v. GARLOCK et al.**  
(Circuit Court of Appeals, First Circuit. November 3, 1909. Rehearing denied. 142 F. R. p. 461.)

**1. PATENTS—INVENTION—ADAPTING MATERIAL TO NEW USE.**

A patent for a material for making steam packing may involve invention, although a similar material had previously been used for other and wholly different purposes.

**2. SAME.**

Where a patent for a material to be used for a stated purpose involved invention, it is not necessarily rendered invalid by the fact that the patentee also suggests its use for a different purpose, for which alone it would not be patentable.

**3. SAME—INFRINGEMENT—MATERIAL FOR STEAM PACKING.**

The Forsyth patent, No. 622,889, for a sheet material for packing, mating and the like, was not anticipated and discloses invention in so far as it relates to a packing material; also held infringed.

**COHEN et al. v. STEPHENSON & CO.**  
(Circuit Court of Appeals, Third Circuit. 142 F. R. p. 467.)

**PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.**

Where a patent has been sustained by a Circuit Court of Appeals, the only question open on an application for a preliminary injunction in a subsequent suit in the same circuit is that of infringement, unless new evidence of invalidity of a conclusive character is produced.

**COVEL MFG. CO. v. RICH et al.**  
(Circuit Court of Appeals, Seventh Circuit. 142 F. R. p. 468.)

**PATENTS—INVENTION—SAW SHARPENING MACHINES.**

The Schofield patents, Nos. 654,843, 654,844, and 654,845, and the Fustrup and Schofield patent, No. 669,251, all relating to improvements in saw-sharpening machines, are void for lack of patentable invention in view of the prior art, in which the same devices were found in use in saw-swaging machines.

**WESTERN ELECTRIC CO. v. ROBERTSON, et al.**

(Circuit Court of Appeals, Second Circuit. 142 F. R. p. 471.)

**1. PATENTS—CONSTRUCTION OF LICENSE—ROYALTY.**

A contract by which a patentee licensed defendant to use any one or more of the devices "described and claimed" in a patent, and required defendant to pay a royalty therefor must be construed as requiring payment only for the use of such devices as defendant would not otherwise have the right to use because covered by the patent, and does not subject him to payment of royalty because of his use of one element only of a combination patented as a whole.

**2. SAME—INFRINGEMENT—WHEN QUESTION OF LAW.**

Where the question of infringement depends entirely upon the construction of a patent, either upon its face, or in connection with facts not to be reasonably disputed, the question is one of law for the court.

**3. SAME—INFRINGEMENT—HYDRAULIC LEAD PRESS.**

The Robertson patent, No. 346,563 for a hydraulic lead press construed in an action for the recovery of royalties from a licensee, and held so limited by the prior art as not to embrace the structure of defendant, so as to render it liable for royalties thereon.

**EASTERN PAPER BAG CO. v. CONTINENTAL PAPER BAG CO.**

(Circuit Court, D. Maine. 142 F. R. p. 479.)

**1. PATENTS—SUIT FOR INFRINGEMENT—JURISDICTION OF EQUITY.**

Quere, whether a suit in equity may be maintained for an injunction to restrain infringement of a patent, as well as for an accounting, although the owner of the patent has never constructed a machine thereunder for practical use, and apparently does not intend to do so, but merely to hold the patent to prevent the use of the invention by competitors in business.

**2. SAME—INVENTION.**

Invention may exist in substituting a new and different operating part in a machine, notwithstanding it does not constitute such an advance in the art as to lead the owner of the patent to discard old machines and use those of the patent. It may be enough that the substitution addresses itself to any considerable portion of the community and creates an opportunity for electing between different methods.

**3. SAME—CONSTRUCTION OF CLAIMS—LIMITATION BY SPECIFICATION.**

The rule applied that where the claims of a patent for a machine refer generally to "means" for accomplishing a specified result or movement, without claiming such means, they are not limited by a description of particular means in the specification, given for the purpose of explaining the mode in which the patentee contemplates applying the principle of his invention, as required by Rev. St. § 4885 [U. S. Comp. St. 1901, p. 3383.]

**4. SAME—DEFENSE OF INVALIDITY—MEASURE OF PROOF.**

The rule applied that defenses which impugn the legality of a patent, issued with apparent regularity, must be supported at least by proofs which are satisfactory to the court, and cannot be established by a mere preponderance of the evidence, and this to the extent of requiring the proof to be clear, unequivocal, and convincing, where fraud and criminal acts in the procurement of the patent are charged.

**5. SAME—VALIDITY—MECHANISM SUPPLIED BY ANOTHER THAN THE PATENTEE.**

The fact that another than the patentee contributed to the mechanism necessary to make the invention operative does not affect the validity of any claims of the patent which do not cover the mechanism so supplied, either as a whole or in combination.

**6. SAME—SUIT FOR INFRINGEMENT—DEFENSES.**

It is not open to an alleged infringer to collaterally attack a patent on the ground of fraud in its procurement, so that the patentee's solicitor contributed a substantial part of the invention and embodied it in the application after the patentee had made oath to the same.

**7. SAME—PRIORITY OF INVENTION.**

The Rule applied that where two inventors are working contemporaneously, but independently, on the same invention, the one who first reduces his ideas to a definite form by means of a written description,

model, or drawing, and obtains a patent therefor, is entitled to priority.

**8. SAME.**

Evidence considered, and held insufficient to overcome the presumption of priority of invention in favor of the Liddell patent, No. 558,969, for a paper bag machine over the Claussen patent, No. 558,497, for which application was made after the issuance of the Liddell patent.

**9. SAME—INFRINGEMENT—PAPER BAG MACHINES.**

The Liddell patent, No. 558,969, claims 1, 2, and 7 for a paper bag machine, the essential feature of which is the use of a rotating cylinder, instead of a reciprocating carrier, as the bed on which the folding is performed, in combination with a forming plate oscillating on its rear edge on the surface of the cylinder, were not anticipated nor narrowed by anything in the prior art, and they disclose patentable invention. Also, held infringed by the machine of the Claussen patent, No. 558,497.

**EASTERN PAPER BAG CO. v. CONTINENTAL PAPER BAG CO.**

(Circuit Court, D. Maine. 142 F. R. p. 517.)

**1. SAME—PROFITS—SAVINGS BY USE OF INFRINGING DEVICE.**

Where a patent for certain improvements in machines for making paper bags was found to be infringed by machines made and used, but not sold, by defendant, and it appears that the product of such machines has no superiority which gives it an enhanced price over that of noninfringing machines, the only profits recoverable are the savings in the cost of construction and maintenance of the machines, or in the cost of the product due to the use of the infringing devices.

**2. SAME—RULES GOVERNING ACCOUNTING.**

The rules applicable on an accounting for damages and profits for infringement of a patent discussed with reference to the particular facts shown by the record.

**RUBBER TIRE WHEEL CO. v. MILWAUKEE RUBBER WORKS CO.**

(Circuit Court, E. D. Wisconsin. 142 F. R. p. 531.)

**1. PATENTS—LICENSES—RIGHT TO ATTACH CONDITIONS.**

It is within the rights of the owner of a patent to grant licenses conditioned that the licensees shall sell the patented article only at prices fixed by the agreement and also restricting the production of a licensee, and such agreements, if made in good faith and for the purpose of protecting the patent monopoly, are not illegal as in restraint of trade and commerce, and such good faith is not impeached by the fact that the patent has been held invalid by the Federal courts in some circuits, where it has been sustained in others.

**2. PATENTS—LICENSES—VALIDITY OF PROVISIONS—RESTRAINT OF TRADE.**

Complainant, owner of a patent for a rubber tire which has been adjudged invalid by the Circuit Court of Appeals for the Sixth Circuit, entered into license contracts with all of the large manufacturers of tires in the United States, all of whom were engaged in interstate commerce. Such contracts were uniform, and each made a part thereof collateral contracts made at the same time, one of which was between complainant on one part and all of the licensees on the other. As a whole the contracts provided for the payment of a royalty equal to 4 per cent, of the net selling price of the tires made thereunder, fixed the prices at which the tires should be sold at a substantial advance over the then market price, and also limited the production of each licensee to a certain per cent, of the production of all, providing that if the licensee made less than his "quota" he should be paid a rebate of 20 per cent, on the value of the shortage, and if he made more he should pay a royalty of 20 per cent, on the excess. The contracts also provided for a board to supervise the operations of the licensees to which one-half the royalties should be paid, and which should have power, with the consent of a majority of the licensees, to purchase tires from any of them and resell at such prices as is deemed for the interest of all. Held, that such contracts went beyond the rights of complainant under its patent monopoly in raising and maintaining prices in the states composing the Sixth Federal circuit, in which the monopoly had no practical existence, and in creating a fund to be used to crush competition by outside manufacturers, as well in the Sixth circuit as elsewhere, and were illegal and void as creating a combination in restraint of interstate trade and commerce, in violation of the anti-trust act (Act July 2, 1890, c. 647, 26 Stat. 209 [U. S. Comp. St. 1901, p. 3200.]



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured  
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of E. G. Siggers, Patent Lawyer,  
Washington, D. C.

Stanislas Bourgeois, Manchester, N. H. Trolley.—The latest patent to Mr. Bourgeois is an improvement on patent No. 657,637. The trolley head is provided with a guard so formed that when swung down from an elevated position, it will strike the wire and cause the trolley to move sidewise so as to compel the trolley to assume a position below the wire without material interference from the latter. The device also embraces a novel arrangement of springs, whereby the trolley wheel is kept in a central position, but is permitted to yield sidewise to accommodate lateral deflections in the wire.

Lewis H. Emerson and Samuel P. Kerstetter, De Young, Pa. Two patents.—The inventions covered by the patents relate to drilling mechanism, and the first one covers a drill derrick. In view of the scarcity of timber, the cost of the ordinary derrick is constantly increasing and is becoming a serious consideration in the sinking of new wells. The patented derrick is composed of a comparatively small amount of lumber, and at the same time is amply strong and durable. It consists of convergently disposed mud sills, and a transversely disposed samson post and mud sill. Stringers are located above the sills and support a suitable flooring. A cross sill is located on the mud sills, and is secured in place by suitable wedges. A mast having its lower end dovetailed into the cross sill is braced by suitable guy cables that are connected to the outer ends of the mud sills.

The second patent covers an oil well rig, and the primary object in this case is to provide a strong structure employing a comparatively small amount of lumber. The rig consists of spaced mud sills with a nose sill located at one side of the same. A samson post is mounted on the mud sill that is adjacent to the nose sill, and a cross bar is secured to the samson post. Downwardly-inclined girders secured to the cross bar and to the other mud sill, are suitably braced, and braces for the cross bar and the samson post are connected to the nose sill. A drive wheel is journaled on the girder, and a walking beam is pivoted on the samson post, and has a connection with the drive wheel. A stringer connects the mud sills, and a jack post is supported thereon, while a lever is pivotally supported on one of the girders. The sand reel, journaled in the lever and in the jack post, is thus movable into and out of co-action with the drive wheel.

Richard Holland, Ward, S. Dakota. Harvesting Machine.—This invention relates more particularly to the operating means for the aprons, elevators and binding mechanism of a harvester. As is well known, the motion of the main driving or bull wheel is variable, and often the entire mechanism dependent thereon is brought to a complete stop, as when making a turn. Mr. Holland employs a novel fly wheel driving mechanism, which will continue the movement of the mechanism when the bull wheel stops from any cause. He employs the usual pitman driving shaft, and a driving member rotatably mounted on the rear end of the same, and having a plurality of sprocket wheels. A clutch connection is provided between the driving shaft and this member. A fly wheel suitably journaled on the rear of the machine has a frictional clutch connection with the sprocket wheel, and an endless sprocket chain engaging one of the sprocket wheels of the

member also engages the sprocket wheels of the conveyer aprons, and the fly wheel. Thus the fly wheel is set in operation during the ordinary movement of the machine, but should said machine be brought to a standstill, the power stored in the fly wheel will cause it to continue the movement of the mechanism temporarily.

Herman Greeder, Cincinnati, Ohio. Waxing Pad.—The object of this device is to provide a pad to be employed in cleaning and waxing laundry and tailors' irons, the pad containing a comparatively great amount of waxing composition that will automatically be delivered to the iron without waste, at the same time cleaning such iron of all dust, dirt and adhering matter. The pad comprises a body of absorbent or blotting paper, and commingled wax. Eucalyptus oil and formaldehyde is contained in the paper. A fabric casing covers both sides of the body, and such casing is impregnated with sodium tungstate to render it fire proof.

David W. Martin, inventor; Edward Hopfer, assignee, Portage, Pa. Nut Lock.—This is an extremely efficient lock, which will positively hold a nut against detachment. A base plate is employed having a bolt-receiving opening therein, and a socket in its outer face. A bolt passes through the base plate, and a washer, located on the bolt, covers the socket. The washer has a slot, the inner portion of which aligns with the outer portion of the socket, and a nut of the ordinary character is threaded on the bolt and bears against the washer. A locking strip is employed that has one end disposed between the washer and bolt, an intermediate portion being seated in the socket and held there by the washer, and an outturned outer end passes through the slot of the washer and engages one side of the nut, thereby positively holding it against turning.

Josephus N. Kirk, Burnet, Texas. Seed Planter.—It is the aim of this invention to provide a seed planter capable of dropping corn, cotton, and other seed without crushing or otherwise injuring the same, and adapted to expose the grain to view in order that the operator may see whether the planter is working properly, and this without the seed being blown from the same, or jolted therefrom when the planter is traveling over rough and hilly ground. The seed planter embodies a hopper, a feed wheel operating within and extending above the hopper, a cover hinged at the front to the hopper and provided with a longitudinal opening receiving the upper portion of the feed wheel, and a spout arranged at the back of the hopper in position to receive the seed from the feed wheel. The cover is provided at opposite sides of the feed wheel with segmental guards, spaced apart to expose the periphery of the feed wheel and extending beyond the same. The feed wheel is provided with a seed carrying fork, composed of two sides, and a transverse portion, which is secured to the feed wheel. This seed carrying fork co-operates with a relatively fixed fork, adjustably mounted at the spout and extending between the sides of the seed carrying fork to positively dislodge the seed and cause the same to fall into the spout.

William Mitterreiter, Water Valley, Miss. Cross Head for Locomotives.—This patent covers an important improvement in cross heads for locomotives, as it dispenses with the gibs ordinarily employed on cross heads, and it also enables the upper portion, which is connected with the guides, to be removed either wholly or partially, without interfering with the connections between the cross head and the main piston rod. The cross head, which operates in connection with

upper and lower guides, is provided at opposite sides with recesses, and the intermediate portion of the cross head between the said recesses fits against the lower guide. Sides or wings which are secured in the recesses, fit against the side faces of the lower guide and extend across the space between the guides. Anti friction devices are arranged between the guides and are carried by the sides or wings.

Ashmore P. Patterson, Lansdowne, Pa. Gleaner Attachment for Binders.—The present invention relates to means which may be attached to any ordinary type of binder, and which will elevate the grain onto the platform. The object is to provide an extremely simple attachment of the above character, which will efficiently perform its work on level or uneven ground, and will properly position the grain on the platform carrier of the binder. An attaching bar is employed which is provided with novel means for securing it to the platform of a binder. An extensible frame is pivoted at the rear end to the attaching bar, and rollers are mounted upon the front and rear ends of the frame. Around these rollers pass belts carrying outstanding fingers. Over the rear roller are extended guard fingers which insure the proper delivery of the material upon the carrier of the binder, and adjustable shoes are hinged to the frame and support the same at the proper distance above the ground.

Charles F. Bettman and John Zapp, New Albany, Indiana. Wire Support.—The device covered by this patent is an extremely simple article constituting an efficient support for electric conductor wires, permitting the detachment of the wires if desired, and constituting means for automatically securing the wire should the same break between adjacent poles or supports, thus preventing its falling to the ground or street, and thereby endangering the lives of passersby. In the construction shown, an insulator is employed that is arranged to be passed through a suitable support, and a stem is journaled in the insulator and has a cap covering the upper end thereof. The stem is provided with an offset neck, and a head is carried by the neck and has oppositely extending overlapped beaks, forming a wire-receiving seat, that is tapered to constitute a clutch for the wire.

John Gregg, Storms, Ohio. Buncher for Mowing Machines.—This invention is a clover buncher, though useful in collecting grasses and grains as the same is cut. It is in the form of an attachment, and can be applied to an ordinary mowing machine. The principal feature relates to certain improvements in the operating mechanism for the holding and releasing means, in order that such means may be more conveniently operated, and is not liable to accidental actuation. The buncher mechanism includes holding fingers, and a rock shaft that constitutes a support for the holding fingers. A crank shaft is secured to one side of the rock shaft, and a supporting bar having an upstanding guide also has means for securing it to a mowing machine. A hand lever is supported upon the supporting bar and is provided with a suitable lock, while a link connects the lever and the crank arm. A brace bar is secured at one end to the pivot of the lever, and has its other end connected to the rock shaft, said brace bar passing through the upstanding guide.

William L. Viebrock, Lime Spring, Iowa. Draft Equalizer.—The patent involves decidedly novel means for hitching a number of draft animals to an agricultural implement, more particularly a plow, and the arrangement

is such that the animals, with one exception, will be upon unplowed ground, while the one will walk in the last or open furrow. This is secured without any side draft. A clevis is employed with means for connecting the same to an implement, and an evenner is made use of that has a link connection with the clevis. An extensible link holds the said link connection in different angular relations with respect to the clevis, the latter link comprising a sectional rod that has means at its rear end for attachment to an implement. A stirrup is secured to the front end of the rod, said stirrup slidably embracing the clevis and being pivoted to the link connection. The various parts are relatively adjustable, in order that the evenner and the whiffletrees attached thereto may be properly positioned with respect to the implement.

Felix A. Perkins, Port Dover, Ontario, Canada. Spraying Apparatus.—The spraying machine of this patent is designed for spraying trees and plants, and it is capable of enabling a number of spraying nozzles to be simultaneously adjusted, whereby water or other liquid may be advantageously sprayed on trees and plants of different heights. The machine is in successful operation in Canada and parts of the United States. The sprayer enables the nozzle to be adjusted to different angles and inclinations. The apparatus embraces a vehicle, a tank carried by the same, a spray pump driven by one of the wheels of the vehicle, and discharge pipes having nozzles and provided with flexible portions. The nozzles are supported by independently movable inner and outer supports. The inner support forms a fulcrum or bearing, and the outer support, which is connected with the discharge pipes adjacent to the nozzles, is raised and lowered by an operating lever.

William W. Terriff, Portland, Mich. Washing Machine.—This invention has for its object to provide a washing machine, having a rubber and operating mechanism adapted, after the operation of washing has been completed, to be readily detached from the tub or body to reduce the weight of the machine and enable the same to be easily handled. The washing machine embodies an oscillatory rubber having slotted arms, a shaft journaled on the body and extending through the slots of the arms to pivot the rubber to the body, an oscillatory support mounted on and carried by the shaft, and an operating lever fulcrumed on the support and connected with the arms of the rubber.

Charles A. Youngren and John F. Kuhry, Sioux City, Iowa. Burglar Alarm.—The burglar alarm of this patent is adapted to be readily applied to a window or door, and should the latter be opened, it will explode a cartridge and thereby alarm the occupants of a house or apartment, and at the same time frighten away the intruders. One of the particular advantages of this device is that it will permit a window to be partially raised to afford ventilation, and yet will operate should the sash be raised to a greater extent. It is invisible from the exterior, and is located out of harm's way, and may be readily thrown out of operation when it is desired to open the window or door to which it is applied. The device comprises a supporting frame provided with a cartridge receiving socket, a spring-actuated firing pin guided on the frame and adapted to explode a cartridge, and a trigger for setting and releasing the firing pin. A coiled spring is disposed on the firing pin, and a block is detachably and adjustably secured to the pin for controlling the tension of the spring, and for detachably retaining the firing pin in the guides of the supporting frame.





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**FOR SALE**—Patent No. 809,905, dated January 9, 1906, also Canadian patent. Overshoe fastener for fastening overshoes to prevent slipping off the heel of shoe. For further information apply to inventor. W. O. Brockway, 8445 Union Avenue, Chicago, Ill. oct

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**FOR SALE**—Patent No. 815,084. Pawl and Ratchet. The invention is a ratchet drill wheel with a pawl on each side of the wheel, connected to the same lever. Address, J. S. Fletcher, Mound City, Kansas. oct

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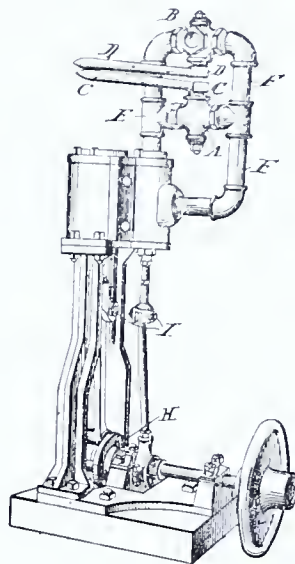
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Patent No. 761,426.  
REVERSING VALVE FOR STEAM ENGINES.



**CLAIM.**—In a reversing-valve device, a supply-pipe and an exhaust pipe, valve connections between said pipes, a two-way valve in each of said connections, and valve-levers for said valves in proximity to each other, whereby the valves may be worked by hand or independently of each, substantially as described.

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## Wealth from Waste.

The scrap heap of yesterday holds the fortunes of today. It sounds like a fairy story to be told that the street sweepings, the garbage, the dust heaps, the refuse that have been regarded as worse than useless, since they had to be destroyed for sanitary reasons, contain products worth millions of dollars. The last decade has seen an increase in the production of wealth never before paralleled in the world's history, and it is largely due to the fact that in every branch of industry, the things that have been thrown away have become a source of revenue. Indeed, in many instances the by-product has become more valuable than the original product itself. This is true, for instance, of the Standard Oil industry. Formerly one-third of the company's products was wasted. Today that waste is manufactured into hundreds of by-products. The naphtha is transformed into various grades of gasoline for all kinds of motors and for use in the arts. The oil refuse is used for paraffin wax, for vaselene and salves, and for numerous tar products, including aniline dyes in all the colors of the rainbow, and flavoring extracts in all the flavors of the orchard and garden. The meanest refuse is turned into fertilizer.

Iron is one of our greatest sources of wealth. Billions of dollars have been made in this country in the manufacture of iron; and yet it is probable that in the near future, the iron itself will become a mere by-product of something even more valuable. From the furnace in which the ore liquefies there rushes a quantity of gas. It has been found that a furnace smelting 7 tons of pig iron an hour, will make enough furnace gas in the same period to supply 9000 horse-power. Deducting what can be used on the premises, there will be a surplus of 5000 horse-power per hour to dispose of. Now that we can transmit power cheaply by high tension currents, it is easy to see the value of this product. In New York, for instance, they sell electromotive force from 4 to

12 cents per horse-power per hour. Taking it at the lowest rate, the 5000 horse-power means \$200 per hour, which is more money than seven tons of pig iron will bring.

There are other economies in the iron industry. Iron slag, which was formerly regarded as of no use whatever, is now employed in making a strong, durable brick suitable for houses. Slag powder is also used for making a fine cement. Old metal is melted down and utilized again for structural purposes. Even old tin cans are collected and the solder and tin recovered and used for toys. The bloom upon the cheeks of footlight favorites may be traced to the tin pans that rattle in the rag-collector's cart. These vessels are made of plates of iron, coated with tin. The plates have to be "pickled," as it is called. All the rust and other substances than the clean iron have to be washed off with acids. On the pickling water is left iron rust, which is the basis of a fine rouge.

It is an old joke among meat packers that nothing is lost of the pig but the squeal. Cattle are quite as versatile. The meat is eaten, the hides are used for many products, the hoofs for making huttons, and in the manufacture of chemicals important in extracting gold from low grade ores. The blood furnishes the basis for the albumen used by the tanner or sugar refiner. The fat yields a gelatine which is one of the most valuable substances in modern pharmacy. Glue comes from the brain, isinglass from the knuckles, soap from the grease. The hairfelt used for insulating electric wires comes from the slaughter house; so does the curled hair with which our chairs are stuffed, and the bristles in our shoe brushes. The tips of cows' horns are employed for the mouthpieces of pipes, and the horns themselves for combs and the backs of brushes. The bones in the feet of cattle are hard and take a high polish; so they are employed in place of ivory. From the hodies is obtained the tallow which is made into oleomargarine. Pepsin, the remedy for our national ailment, dyspepsia, comes from the pig's stomach. There are all sorts of obscure nervous troubles which can be helped by substances extracted from the gray matter of calves' brains. Other valuable medicines are taken from the rib marrow, the sweetbreads, the thyroid glands, etc. And when all is extracted, the bits and scraps are cooked and dissolved, and fertilizer is the result.

Sawdust is variously transformed into paper, into cabinet woods, into pavements, into tar, charcoal, acids, and naphtha. Even the needles of pine trees are made into a fiber for wadding overcoats.

Fortunes lurk in old wool. After our clothes are worn to rags the wool is picked out and woven anew. As long as it has any staple, the wool is picked apart and employed again. And when there is no longer enough wool to hold together, it becomes a dye—Prussian blue.

Good perfumes are made from the evil smelling oils resulting from the distillation of whisky. The crusts

that gather inside the vats where wine ferments are utilized to make the cream of tartar for our biscuits. Even the delicate, evanescent perfumes of flowers are trapped in lard, and then snared again from the lard by alcohol. If, as has been said by some one, the true test of the industrial civilization of a people is the extent to which every scrap and grain of its resources are utilized, we have a fair foundation for our claim to progress.

## Alcohol in the Industries.

One of the most important acts of the last Congress was the removal of the tax on denatured alcohol, or, in other words, alcohol rendered unfit for human consumption and adapted for use in the arts and industries. It is expected, as a result of this legislation, that heat, light and power will be supplied by alcohol made from the cornfields of our country, from sugar beets and sugar cane, from potatoes and other vegetation.

Up to the passage of this act, there was a tax of \$1.10 per gallon on commercial alcohol, which of course rendered its use for power impossible, although for such purposes it can be manufactured at only 10 cents a gallon. Sugar and starch, when fermenting, yield about half their weight in absolute alcohol. One-fifth of the weight of potatoes, three-fourths the weight of corn, and about one-sixth the weight of sugar beets consist of these fermentable sugars and starches. The average yield from an acre of potatoes—300 bushels—will produce 250 gallons of alcohol, to serve as fuel for stoves and motors. An acre of corn—fifty bushels—will supply 130 gallons of this liquid; but counting the starch that can be extracted from the corn stalks, and that now goes to waste, 100 gallons more of commercial alcohol can be obtained from an acre of corn. Secretary Wilson is quoted as declaring that in 100,000,000 acres of corn, the chance of making ten billion gallons of this alcohol is annually lost, and that the time is at hand when we will utilize this immense source of energy. The fermentable material in the stalks can be extracted by presses similar to those employed to extract the juices of sugar cane.

In a similar manner, sugar beets, molasses, fruits of various sorts, etc., can be used as a basis for the distillation of this new alcohol, with returns much more profitable to the grower than from their present use as food. The distilleries are to be under Government supervision, and the alcohol is to be permitted to leave only after it has been made poisonous and unfit for beverage purposes.

In this novel employment of spirits, we are following in the footsteps of Germany, England, and other European countries where this liquid has long been regarded as one of the necessities of industry. Abroad there are in daily use alcohol engines, alcohol automobiles, alcohol motor boats, alcohol lamps, and alcohol stoves in many patterns and varieties. Alcohol locomotives pull trains of a dozen cars on the large agricultural estates, on sugar plantations, and in

engineering work. Strong vehicles have been constructed for military service, traveling at a speed of ten miles an hour and carrying tools and apparatus for a regiment of sappers and miners. The Germans are beginning to use a certain form of alcohol lamp, a product of the recent discovery that this vapor burned in a lamp hooded with a Welsbach mantel causes an incandescent light of great brilliancy. Lamps of all sizes and for all purposes are being manufactured as a result of this combination. There are alcohol ceiling lamps, resembling arc lights, quite as impervious to weather, and yielding an 85 candle power light at a cost of only three-fourths of a cent per hour. The usual electric incandescent light, it should be noted, gives a light of only 16 candle power. Then there are 550 candle power alcohol street lamps, operated at two-thirds of the cost of electricity. All of these lamps produce better light than kerosene, and are less costly. They are smokeless, free from odor, and require no cleaning of wicks or chimneys. Further, they are entirely safe, there being no way by which the flame can communicate with the alcohol. The light, besides, is white, steady, and restful to the eye.

It is proposed by the National Grange that the farmers of the country should establish co-operative distilleries for the sole purpose of producing denatured alcohol. This would provide them with a remunerative outlet for many products which now are wasted, and what is of still greater importance, would furnish a cheap and accessible source of power. Already our farmers are employing gasoline motors to compensate for the scarcity of labor. They are useful for shelling corn, sawing wood, baling hay, thrashing, churning, spraying fruit trees, pumping water, and for many other purposes. In some places they take the place of horses for mowing and reaping. But the supply of gasoline has been diminishing, and the price consequently increasing. Moreover, it is almost as perilous to have about as dynamite, and any one who keeps it on hand must pay a high rate of insurance. Alcohol, on the other hand, vaporizes so much more than gasoline, that it is not a dangerous explosive mixture in the open air; and if it catches fire it can be readily extinguished by water, which only spreads the fire when played upon gasoline. But a prime consideration is its cheapness. No longer need we depend upon coal and wood for fuel, and upon oil and gas for light. The diminishing supply of wood, the rising price of coal, should no longer alarm us. A strike in the coal mining regions, the arbitrary exactions of the Standard Oil trust, need not in future give cause for anxiety. A source of power, light and fuel cheap enough to bring it within reach of the poorest, and which can be derived from a dozen of our most common products, is within our reach.

THE INVENTIVE AGE contains sound advice to inventors and patentees. For lack of such advice many have lost money. Subscription, one dollar a year.



### Dessicated Milk.

Among the new ideas which are being worked out into practical results in the world's agricultural economy is the dessication of milk, eggs, and other food materials by means of a mechanical process. The importance of this method will be inferred from a brief consideration of certain primary facts which underlie the science of dairying.

Rich milk contains approximately 85 parts of water to 15 parts of butter, casein, sugar, etc. In poor milk, the proportion of water is even greater. There are thus always about 7 pounds of water to be taken care of in milk for each pound of food material. Moreover milk is, of all substances, one of the most susceptible to fermentation and deterioration. The milk first drawn from the cow contains a colony of bacilli sufficient when the warm liquid is left exposed to the air to fill the whole mass with a myriad of bacteria, which cause it to sour.

To prevent this tendency, modern dairy practice employs two methods—the immediate chilling of the milk in cold reservoirs, and the pasteurization or partial sterilization by heating it to about 170° F., which paralyzes the micro organisms and retards their reproduction, so that milk treated in this way can be preserved longer than in its natural condition. Neither of these processes, however, prevents, but only retards for a few hours the inevitable degeneration of milk.

Moreover, there is the peril which may always lurk in the milk supply of a city or district through contamination with the germs of tuberculosis, cholera, scarlet and typhoid fevers, all of which diseases may infect the animals from which it is drawn. One of the most potent sources of infant mortality, it is declared, lies in the lack of sanitary milk.

It is the object of the new process to prevent these perils. The principal feature of the system is a machine weighing about two tons, which includes two steel cylinders 5 feet in length by 30 inches in diameter, set in a strong iron frame, and so adjusted that the faces of the two cylinders, which revolve in opposite directions, are about one-sixteenth of an inch apart. The cylinders are heated by steam at a pressure of three atmospheres and introduced through the trunnions to a temperature of about 240 F., sufficient to not only evaporate almost instantaneously the film of milk distributed over the heated surface, but to effectually destroy every germ that it may contain.

Into the triangular space between the rollers the milk is fed in the form of jets from a perforated supply tube or trough at a rate of from 80 to 100 gallons per hour, the supply being varied somewhat in accordance with the speed at which the cylinders are run; that is, from ten to fifteen turns per minute. The milk, passing downward by gravity, oozes slowly through the extremely narrow slit or space between the cylinders, is taken up by adhesion to the heated surface, passes around under the cylinder and appears in a thin, almost invisible film

of dried milk, having about the thickness of heavy paper, which when about three-fifths of the cylinder's revolution has been completed, is shaven or peeled off from the steel surface by a knife or scraper adjusted by set screws so as to clear the surface of the cylinder without cutting or abrading the metal. The white film of dried milk, peeled up and turned backward by the knife, falls into a receptacle below each cylinder, whence it is removed, passed through a coarse sieve, and becomes the completed product, or flour of milk, containing butter, casein, milk sugar and phosphates in the exact proportions as provided by the liquid milk.

By this method, twenty gallons of rich milk can be made to yield about 25 gallons of meal, containing say 30 per cent of butter. It has the additional advantage of utilizing skimmed milk, usually regarded as a waste product. A mixture of equal parts of full milk and skimmed milk will yield for every 20 gallons, about 21 pounds of meal, containing a full complement of casein, sugar and phosphates, with about 16 per cent of butter. In both cases the product is a dry, white, homogenous flour or powder containing about 37 per cent of nitrogenous matter, 47 per cent of saccharine elements, having about one seventh of the weight of the liquid milk from which it was condensed, and capable of being put up in tin cans, transported to any distance by sea or land, preserved indefinitely and ready for use at any moment either by mixing with flour in the preparation of many articles of diet, with ground materials in the manufacture of cocoa and chocolates, or of being reconverted into liquid milk by simply dissolving in water at a high temperature.

The digestibility of milk, it has been demonstrated by numerous tests, is not diminished by dessication. On the other hand, it has been shown that the perfect sterilization of milk powder suppresses the maladies of the digestive organs to which infants are so frequently subject. The milk powder preserves all the qualities of fresh milk—its taste and appearance, nutritive value, and digestibility.

The range and application of such a system will be readily inferred. A machine which will dessicate from 800 to 1000 gallons of milk per day requires as motive and heating powder the consumption of about 500 pounds of coal. The powder can be shipped in bags and boxes, and when put up in tin cans, can be conserved indefinitely for use on shipboard, in military campaigns, or in hospitals. Stores are being established for the exclusive sale of milk powder, and through these depots, bakers, pastry cooks, confectioners and manufacturers can derive a clean, condensed and cheap form of milk, perfectly adapted to their purposes, while to the poorer classes of people in a great city, there will be offered a supply of pure and digestible food for young children at a price they can afford to pay.

In the dessication of eggs, the system is practically the same. The eggs are broken into a vat, mixed with warm water and drawn through a rotary pump, which converts the mixture into a homogeneous fluid. This is passed through the drying machine and issues in the form of a light, yellowish meal having all the nutritive qualities of the natural eggs, but capable of indefinite preservation and perfectly adapted to the making of custards, omelets, pastry and other forms of food.

### Studying the Body.

There is no department of study in which knowledge should be more diffused, and which should be regarded as of higher importance, than that relating to the human body. And yet, up to within a comparatively recent period, physiology was given no special weight in the curriculum of schools, and children were taught to construe and scan rather than to understand the functions and requirements of this piece of work called man. It is reassuring to think that this neglect is now being remedied, and that an intimate knowledge of the organs of the body is recognized as of literally vital importance. But few people know the details of the scientific studies that are being made of the human frame. Experimenters have not only directed their attention to the nourishment of the body, to the purposes of food and its relation to growth, health and other physical conditions, but we have even come to the point of measuring the breath. The body is constantly giving off invisible material in this manner, as well as through the radiation of heat from its surface, and it is necessary for us to know the kind and amount of these unseen products, and their relation to food, to work performed, and to other factors.

For this purpose, an elaborate apparatus has been contrived, to which is given the name of calorimeter. It consists of an air tight copper box, surrounded by zinc and wooden walls with air spaces between. It is large enough to enable a man to remain in it in comfort for a sufficient number of days to enable the investigations to be made, and contains a folding bed, chair, table and similar conveniences. A current of air is pumped through the box, so as to supply him with the proper atmospheric conditions, and he communicates with the observer through a telephone.

In order for heat to be given off from a furnace, a supply of fuel must be kept up; something of the same nature is true of the human body, the fuel, in this case, being meat, vegetables, and other foods which constitute the daily diet. Combustion in a furnace and combustion in the body, however dissimilar they may appear, are the same from a chemical standpoint. Continuing the comparison, the respiration corresponds to smoke. One important difference, however, is that the body is self-repairing and self-regulating. To determine the efficiency of an engine, we need information regarding such factors as the energy or heat value of the fuel, the amount of ashes, the quantity of fuel required for the different kinds of work, etc. It is equally true that in the case of the body we need to know the most wholesome kinds of food, the relation of the waste products to food and work performed, the amount of work possible on a given ration, and in short, the best diet to maintain the body machine in perfect condition.

In carrying out the experiments, the food for the subject is prepared and each portion weighed; the ventilating air current is regulated, and measured as it leaves the box; the

oxygen supply is controlled, the power which drives the air pumps and other machinery watched, and thermoelectric records taken every few minutes. The labor involved in conducting a complete experiment can be judged from the fact that the entire time of sixteen men is occupied in weighing, measuring, recording data, etc. There is no interruption of the work at night, the subject being studied while he sleeps quietly within the box.

Experiments, up to the present, have all been made with active men in good health. A regular program, drawn up in advance, is followed from day to day. The food is carefully chosen, and made palatable, so as to insure normal results. Sometimes the subject fasts for a day, for purposes of comparison. In the rest experiments, he sits still, reading or writing a little to pass the time. At other times, he engages in active muscular or mental work. In order to permit of exercise an apparatus resembling a bicycle is introduced into the box. The subject sits upon it and operates the pedals, but instead of the rear wheel, there is a copper disk which revolves between the two poles of an electro-magnet. When there is no current passing through the magnet, the disk may be turned very easily; but when the current is turned on it acts as a brake, and it requires considerable muscular effort to move the disk. In this way, the amount of resistance actually applied can be measured; and by varying the current, it is possible to control the amount of work performed.

One of the most interesting features of the apparatus is found in the devices for measuring the heat given off from the body. A current of cold water—similar to that used in cooling cold storage chambers—is passed through pipes which have a large surface, so that they may easily absorb heat. As the water enters and as it leaves, the temperature is noted. The weight of the water, the rise in temperature, and the specific heat of the water being known, the amount of heat absorbed by the current may be readily calculated. In practice, the heat is brought away as rapidly as it leaves the body, and the temperature of the chamber is thus kept constant. Delicate electrical thermometers within the box indicate the rise of one hundredth of a degree, and if the subject gets up from his chair or even stretches his arms, there is a fluctuation which the observer at once detects.

Through the agency of the calorimeter, many important problems relating to the fundamental laws of nutrition have been investigated. The observers have been enabled to measure the effects of food and fasting, rest, sleep, muscular and mental activity and other conditions on the food requirements, the changes which the matter and energy supplied by the food undergoes in the body, and similar questions of great interest and importance.

### Growth of Iron.

An English civil engineer, writing to the London Times concerning an article about the "growth of iron," says:

I have never seen this in print before, nor have I ever heard the term used, but during an experience of over thirty years I have felt sure that such has been the case. Rails that have fitted swing bridges with plenty of clearance have had to be shortened repeatedly year after year, and only recently I have known an instance of a swing bridge which had been open for half an hour that could not be put back until some of the iron work had been reduced. The bridge had been built for some thirteen years, and had been opened and closed during that time many hundreds of times. There is little doubt in my mind that iron heated and cooled alternately does permanently lengthen.



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Blast charges. Device for firing..... J. Dowd  
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Boat. Stone..... H. A. McLean  
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Bookbinding..... M. S. Moll  
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Bottle neck making and finishing device..... W. S. & H. H. Breeden  
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Braiding machine..... A. B. Diss  
Bread mixer..... P. C. Smith  
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Bridle..... C. H. Nesselroad  
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Burning brand..... H. F. Alburger  
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Calculating machine..... C. F. Laganke et al  
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Cans, &c. Handle for milk..... G. E. Pitts  
Candy pulling machine..... C. M. Waite  
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Car curtain fastener. Vestibule..... F. L. Madison  
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Car. Passenger..... C. H. Turner  
Car protector and rail cleaner..... N. P. Danielsen  
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Cais. Folding table for railway..... R. L. Spencer  
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Casting machine..... C. H. Bierbaum  
Cement block machine..... L. T. Lowe  
Cement blocks waterproof. Rendering..... J. M. Rauhoff  
Cement. Burning..... B. E. Eldred  
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Cementitious binder or liquid glue..... G. Kelly  
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Centrifugal machine..... A. Hoffbauer  
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Churn..... W. Sanders  
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Clamp for circular and irregular shapes..... F. A. Spencer  
Clay product burning kiln..... J. T. H. Warwood  
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Clock. Talking..... C. C. Bishop  
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Cock. Ball..... J. H. Knight  
Collar. Horse..... T. S. Harris  
Collar shaping machine. Horse..... R. S. Mason  
Composition post or analogous structure..... R. B. Bennett  
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Condenser regulating device..... A. H. Helander  
Condiment holder..... W. Ebbing  
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Cooker. Steam..... J. Riggsbee  
Coop and brooder for young chickens. Combined..... J. A. Clark  
Corn tester. Seed..... C. E. Twamley  
Corset and stocking suspender. Combined..... J. Gutmann  
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Crate..... A. C. McKee  
Crate. Foldable shipping..... F. E. Goughly  
Crate. Shipping..... D. T. Harbison  
Cream whipping machine..... C. H. Siegmund  
Crocks, &c. Closure fastener for..... W. E. Dawson  
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Curtain and other roller supporting bracket..... C. A. Corman  
Curtain. Metallic..... M. Schultes  
Curtain support..... H. C. Schofield  
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Door or closure..... N. O. Nelson  
Door or panel for lockers and the like. Metal..... R. W. Jefferis  
Dough mixing and kneading apparatus..... L. A. Roberts  
Draft rigging. Combined friction and spring resistance..... J. F. O'Donnor  
Draft timber support and strengthening device..... H. F. Loeschner  
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Dredging machine..... C. V. Foreman  
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Electric light and power controller..... F. C. Damm  
Electric machine and the like. Dynamo..... L. Torda  
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Electric time switch..... C. A. Ballou  
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Fence or dike..... J. W. Humphrey  
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Floor clamp..... F. L. Buff  
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Gaseous mixtures. Testing..... F. Haber  
Gate..... O. E. Conat  
Gate opener..... E. T. Hill  
Gear. Reversing..... F. E. Fairman  
Gear. Variable speed..... W. E. Marx  
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Glass mold..... C. G. Drew  
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Harvester. Potato..... J. H. Pennick  
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Journal box dust guard..... J. A. Haley  
Journal box or lubricating receptacle dust guard..... J. A. Haley  
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Lamp, Incandescent... J. W. Forster  
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Latch, Door... L. C. & F. R. Peck  
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Lifting jack... M. Hunsfeld et al  
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Looms, Filling feeder for filling replenishing... E. S. Wood  
Mail box... H. G. Homme  
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Match box... G. Borst  
Match making machine... W. E. Williams  
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Measure and weighing device, Combined... P. A. Dietz  
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Metal vessels of angular cross-section, Manufacturing seamless plate... O. Andersson  
Metals and minerals, Mold for molten... R. H. Adams  
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Mine door... C. R. Anderson  
Mine door actuating mechanism, Electrically operated... J. C. Lincoln  
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Motor control system... 2 pats. ... A. Magnuson  
Mouse and rat trap, Self-setting... W. Mackel  
Mower grass collecting receptacle, Lawn... W. Boss  
Muffler... A. F. Lungren  
Music sheet holder... F. W. Barrows  
Musical instruments, Pneumatic for... J. Binnig  
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Nail extractor... J. A. Houlihan  
Needle cushion for spools... A. C. Loomis  
Numbering machine, Typographic... J. A. Loyster  
Nut lock... J. L. Lusher  
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Ore concentrator... W. E. Ford  
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Paper bag machine... E. Stanley  
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Paper winder... J. Butler  
Peat or turf, Apparatus for treating wet... M. Ekenberg  
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Planing machine... G. A. Smith et al  
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Plow, Rotary disk... W. Hay  
Plow stock... G. W. Whitehurst et al  
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Polo, Parlor... L. S. Carter  
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Propulsion and lighting, Marine... G. G. Schroeder  
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Radiator, Portable hot water... H. T. Offerdinger  
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Rails, Anchor or sustaining and securing appliance for tramway and the like... J. Kirkland  
Railway controller, Automatic... B. F. Carpenter  
Railway gate... A. Dyer  
Railway metal draft... R. J. Hall  
Railway metal sleeper... O. Liss  
Railway rail joint... S. F. Stever  
Railway rolling stock, Frame for... T. E. Adams

Railway safety appliance... C. J. Kintner  
Railway selective signal system... F. R. McBerty  
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Railway tie... N. Benjamin  
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Railway track drill... E. Cook  
Railway track structure... W. M. Brown  
Railway turn table... A. C. Scarr  
Railways, Electrically operated line indicator for... C. D. McPhee  
Rat trap... A. E. Salisbury  
Razor, Safety... E. Schaff  
Red lake... O. Ernst  
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Refining engine... W. White  
Reflector and cluster frame, Combined... W. H. Spencer  
Refrigerator... J. W. MacDonald  
Refrigerator cars, Rack construction for... J. C. Coleman et al  
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Rein guard... E. H. Elmore  
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Roller mill, Combined bruising and crushing... A. Joel  
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Rubber, Devulcanizing india... C. A. R. Steenstrup  
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Sanding machine... E. Tyden  
Saw... L. C. Kurtz  
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Screw Ratchet jack... C. H. Jack  
Scriber... F. J. Britton  
Seal and terminal for electric apparatus... H. N. Potter  
Sealing device, Package... C. F. Chapman  
Sectional tank... L. C. Jacques et al  
Sewed articles, Seam for... J. G. Lewis  
Sewing machine... W. C. Free  
Sewing machine... H. Mundlos  
Shade and curtain clamp bracket... C. W. Moore  
Shade and curtain support, Adjustable... J. J. Harper  
Shaft, Flexible... M. C. Lockwood  
Shear mechanism... H. Aiken  
Sheet, Communication... H. W. McDonald  
Shelving, Metal... R. W. Jeffers  
Show case... O. Kampfe  
Sign, Illuminated... J. L. Dawes  
Silo... A. T. Stearns  
Siphon... W. M. Venable  
Slicing machine, Fruit... H. W. Klee et al  
Slimes and similar materials, Apparatus for treating... W. T. Weekley  
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Soap... L. H. Renter  
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Sound reproducer... T. H. Macdonald  
Spinning and twisting rings, Ring holder for... G. L. Pierce  
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Spool and pincushion holder... T. Cope  
Sprinkling car, Electric... S. T. Bole  
Square, Carpenter's framing... L. M. Hodge  
Stacker, Hay... J. H. Bauman  
Stamp holding box... P. Sternau  
Steam chest lubricator D. A. & C. M. Ramage  
Steering gear... A. Mills  
Stool, Folding... G. H. Hutton, Jr  
Stove lid lifter and clothes drier, Combined... F. B. Small et al  
Suspending hook for coats, hats, &c. Portable... F. S. Cormier  
Switch rod mechanism... G. C. Lucas  
Switch throwing device, Automatic... C. J. G. Rickerson  
Switchboard cords, Machine for making... W. J. Burton  
Syringe... W. M. Dean  
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Teeth, Manufacture of plates for artificial... A. Ollendorff  
Telegraph key... J. T. Sheets  
Telephone... J. Z. Miller  
Telephone apparatus... D. H. Wilson  
Telephone system... D. H. Wilson  
Telephone transmitter... H. F. Albright  
Textile gromet web... A. M. Ziegler  
Threshing machine... F. F. Landis  
Tile and sewer outlet protector, Drain... J. A. Tenold  
Tile press... W. P. Meeker  
Time controller, Watchman's electric... P. Reitz  
Time recorder, Automatic... H. B. Palmer  
Tuning apparatus... T. A. Hickman  
Tire, Non slipping... M. Vivian  
Tire, Spring... E. G. Oldfeldt  
Tire, Vehicle... W. Westney  
Tobacco box cover and cutter, Combined... W. F. Dugins  
Tool holder... B. F. Rodas  
Tools, Manufacture of composite H. V. Willie  
Tooth bar... T. O. Berg  
Torpedo machine, Railway... F. Dutcher  
Toy... F. E. Roberts  
Transparent screen... J. C. Wood  
Trap... T. A. Barry  
Trap... E. M. Streeter  
Tray folding machine... I. H. & J. H. Birch  
Tray folding machine, Box... J. P. Wright  
Trolley... H. L. Bryant  
Trousers presser and creaser... R. M. Tate  
Truck, Engine... T. E. Adams  
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Tab fitting... P. Connolly  
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Turbine... E. Blucker  
Turbine... W. F. Newman  
Turbine supporting means, Adjustable... J. Wilkinson  
Turpentine, Clarifying and deodorizing oil of wood... C. I. Goessmann  
Twine, cord, &c... G. I. Goessmann  
Type casting mold... P. G. Nuernberger et al  
Type writer work gage... H. D. Bolton  
Type writing machine... H. S. McCormack  
Type writing machine... R. E. Turner  
Type writing machine... O. C. Kave  
Umbrella ribs, Emergency repair for broken... J. W. De Castro  
Undercenter support... F. H. Lamb  
Universal joint... F. H. Bogart  
Unloading apparatus... J. E. Knight  
Valve... C. P. Tolman  
Valve... F. Schreidt  
Vehicle controlling spring... J. H. Sager  
Vehicle rear seat... G. H. Hutter, Jr  
Vehicle wheel... A. H. Kopperud  
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Vending machines or the like, Automatic signaling and detecting device for... E. L. Harman  
Ventilation terminal... C. P. Gould  
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Water mobile... P. F. Maccaulm  
Water tube boiler... R. Loos  
Water tube boiler, Upright... W. Dougherty  
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Weed cutter... W. R. McKeen, Jr  
Well tubing... A. Smith  
Wheel flange and rail lubricator... A. C. Love  
Wheel washing apparatus, Vehicle... R. M. Sutherland  
Whiffletree... J. N. Richards  
Window mechanism... E. C. Fitch  
Window gravity lock... 3 pats. ... W. A. Heartt  
Window, Metallic... C. H. Hopmann  
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Wire galvanizing apparatus... G. L. Meaker  
Wire goods making machine... H. L. Smith  
Wire reeling machine... F. D. Lingenfelter  
Wrapping or bundling purposes, Device for supporting and delivering paper for... R. H. Chase  
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Writing machine... E. B. Hess et al  
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Badge... C. S. Sherwood, Jr  
Bottle... H. D. Rideely  
Brush holder... H. L. Beach  
Car wheel... R. F. Phillips  
Emblem... F. W. Pollock  
Music indicator... W. E. Thrash  
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Range, Cooking... F. M. Lawrence  
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Account register... A. F. Staples et al  
Agricultural implements, Riding attachment for... L. E. Waterman  
Air and other gases, Apparatus for liquefying... R. P. Pictet  
Air compressor, Compound... E. Hill  
Air or oxygen, Apparatus for producing highly-oxygenized... A. Dechaux  
Amalgam carrier and plunger... H. W. Arthur  
Amusement apparatus... F. W. Thompson  
Amusement device... F. Ingersoll  
Amusement device... E. H. Lanier  
Animal trap... L. Westgaard  
Ankle brace and supporter... A. R. Garrod  
Anode... J. Nelson  
Anthracene derivative and making same... M. H. Isler  
Atomizer... C. J. Davol  
Axle soindie... T. Babbitt  
Bag holder... J. J. Hatin  
Bale bands, Fastening... D. M. Campbell  
Ballot, Pocket... M. Dunn  
Barrel knockdown... G. H. Milligan et al  
Bearing for the ends of shafts, Roller... W. T. Fleming  
Bed Folding... G. Henkel  
Belt coupling... J. N. Johnson  
Belt fastener... E. Mundschenk  
Belts, Machine for attaching slats to conveyor... W. T. Gordon  
Berth, Ship's... D. Tagliacico  
Binder... H. E. Dade  
Binder lock, Loose leaf... A. D. Holquist  
Binder, Loose leaf... G. Labarre  
Binder, Temporary... T. R. Eddy  
Bisulfite liquor, Making... N. Heath  
Blast furnace... M. Mannaberg  
Boat, Sailing... T. Jensen  
Boiler cleaner... H. C. Daley  
Boiler trap... C. Dennis  
Book, Sales... H. P. Brown  
Boot and shoe ware and other goods, Appliance for inserting beading in... E. Townsend  
Bordering machine... W. R. Phillips  
Bore holes, Means for surveying... H. F. Marriott  
Bottle and stopper, Milk... C. M. Conley  
Bottle closure... H. A. Olsson  
Bottle closure... J. G. Klee  
Bottle, Non refillable... M. A. Brown  
Bottle, Non refillable... I. Lovett  
Bottle stopper... S. Villedrouin

Bottle stopper, Non refillable... G. A. Weihe  
Bottle washing machine... D. Wickham  
Bottle washing machine... J. Skinner  
Box fastener... C. Anderson  
Box fastener... W. G. Bartholomew  
Box lifter... F. W. Clugg  
Bracelet... T. W. Foster  
Bracelet... G. D. Holbrook  
Brass, Treating scrap 2 pats. ... H. J. Krets  
Bread and pastry board... F. V. Braymer  
Bread cutter... J. Habrie  
Bridle bit... W. Gardner  
Bucket grip, Tramway... E. A. Brown  
Bucket wheels, Means for preventing the distortion of... W. L. R. Emmet  
Buckle, Cross line... R. B. Benford  
Building construction... C. Collins  
Buildings, Construction of... D. C. Stauffer  
Butter or lard, Means to cut... C. Longstreth  
Buttonhole stitching machine... C. A. Dahl  
Cableway system, Suspension... H. Bozzalla  
Caissons, &c. Construction and sinking of... 2 pats. ... D. E. Moran  
Can and cover... A. L. Whitney  
Can lock, Milk... I. Berger et al  
Can straightening apparatus, Milk... S. C. Keith, Jr  
Car bolster... J. S. Stevenson  
Car bolster, Railway... J. O. Neikirk  
Car brake beam, Railway... J. B. Barnes  
Car construction... A. E. Ostrander  
Car coupling... C. D. Whiting  
Car coupling... 5 pats. ... G. A. Hermanson  
Car coupling... J. Munton et al  
Car coupling... W. S. Schroeder  
Car coupling... S. F. Douglass  
Car diaphragm, Vestibule... L. C. Bassford  
Car freight guard, Open... W. Sheridan  
Car, Hand... W. H. Miller  
Car, Motor... M. W. Kouns  
Car mover... L. J. Muehr  
Car, Steam motor... W. G. Wsgenahls  
Car step, Extension... B. Watson  
Car vestibule curtain... S. M. Dawson  
Cars and like vehicles, Body support for... C. Farez  
Cars, &c. Lock for doors of... L. Neyrat  
Carving machine... F. H. Richards  
Casein curd drier... L. Axtell  
Casein, &c. Manufacture of plastic masses from... L. Collard  
Casting chilled rolls, Mold for... R. H. West  
Catamenial protector... C. L. Williams  
Ceiling switch, Electrical... J. G. Swallow  
Cement... W. Forster  
Cement block machine... F. A. Stare  
Charts, Appliance for tracing courses on... H. E. S. Holt  
Check canceling or stamping device... R. Hampel  
Cheese box... D. J. Macpherson  
Chip drier... C. B. Clark  
Chisel or hammer, Bush... J. Campbell  
Christmas trees or the like, Support or stand for... H. J. Neff  
Chuck... W. W. Doolittle  
Churn... P. Dietrich  
Cisterns, catch basins, &c. Means for guarding openings into... H. J. Birkenkamp  
Cisterns, &c. Top and cover for H. E. Olbrich  
Clasp... C. Andresen  
Clock attachment... J. M. King  
Clock, Electric... U. L. Collins  
Clock, Intermittent alarm... W. E. Porter  
Clock, Intermittent alarm... G. L. Goodrich  
Clothes line apparatus... W. A. F. Schenebeck  
Coal and the like, Composition for briquetting... H. L. Mitchell et al  
Coal cutting machine... A. S. Hamilton  
Coal cutting or winning machine... W. Young et al  
Coal washing jig... W. B. Gillon et al  
Coffee roaster... J. M. Edwards  
Coffee urn... D. O. Dowe  
Coin controlled machine... R. Wales  
Coke quenching apparatus... E. F. Lloyd  
Concentrating table... J. G. Kirksey  
Concrete blocks, Means for handling... H. Z. Kline  
Concrete or cementitious building blocks, Machine for molding... J. H. Hendrickson  
Concrete wall forming apparatus... H. P. Engelhardt  
Condenser or pump, Rotary... B. F. Bergh  
Convertible table... J. Roxee  
Conveyer flights, Machine for forming... F. C. Caldwell  
Copper, Electrolytic production of... J. A. W. Borchers et al  
Copy holder... J. J. Griffin  
Cork, Preserving... H. Gronwald  
Corn popper... C. Stevens  
Corner bead... P. Khne  
Corset steel tipping machine... A. F. Ahlsrud  
Cotton chopper... R. A. Sligh  
Cotton elevator, cleaner, and feeder... S. M. Davis  
Cradle and chair, Combined child's... J. Backe et al  
Crop conveying and loading machine... F. L. Webster  
Cuff holder... R. W. Lewis  
Cultivator... J. Kirkpatrick  
Cultivator... W. H. Thompson  
Current machines, Means for starting alternating... O. F. Whitehurst  
Current motor... R. E. De Camp  
Current rectifier... F. Pawlowski  
Cylinder lining... W. H. Tams  
Dam, Floating wheel... F. W. McNeil  
Denture... R. M. Craig  
Desk tool... W. H. Preston  
Die stock, Adjustable... R. Borden  
Disinfecting apparatus... H. A. Silvera  
Display apparatus... H. J. Hudson  
Dolly, Spring... E. Gage  
Door holder... S. B. Duto  
Door strike, Electric... G. N. Parker  
Draft equalizer... J. Winters  
Draft equalizer... W. H. Tillon  
Driving mechanism... G. W. Moreton  
Drum... E. Zoeller  
Dumb waiter... J. H. Miller  
Duplicating apparatus... M. J. D. Carter  
Dynamos, Protective apparatus for compensator... H. H. Walt  
Edge finishing machine... H. W. Brett  
Electric brake... F. L. Sessions  
Electric circuit wires, Protecting bushing for... J. H. Geest



Electric circuit switch..... E. R. Whitney  
 Electric machine. Dynamo..... W. F. Richards et al  
 Electric circuit controller..... H. W. Leonard  
 Electrical conductor clamp..... S. C. Cutter  
 Electrical distribution system..... J. B. Entz  
 Electrical impulses. Means for transmitting..... F. L. Orr  
 Elevator..... A. Menard  
 Elevator grain spout. Portable..... G. W. & C. D. Baier  
 Elevator slack cable stop..... J. J. Westbrook  
 Ellipsograph..... C. Hanes et al  
 Engine cooling attachment. Explosive..... H. G. Alexander  
 Engine sparkers. Gas..... S. A. Hasbrouck  
 Engineer's alarm. Locomotive..... E. McClintock  
 Envelop and message blank. Combination..... F. A. Nichols  
 Excavator dipper..... W. H. Bates  
 Eye bath cup. Fountain..... F. E. Magill  
 Eyeglass spring..... I. S. Galeski  
 Eyelid. Lacing..... H. B. Keller  
 Fare register handle. Removable..... W. G. Kirchhoff  
 Fare register operating device..... J. A. Stowe  
 Feed bag..... D. D. McKenney  
 Feed cutter..... D. L. Wolf  
 Feeding device..... E. N. Trumpet  
 Fence post..... G. M. Koonitz  
 Fence post..... C. F. Davis  
 Fence post. Artificial stone..... G. & H. Brink  
 Fence post. Cement..... K. J. Angell  
 Fence posts. Means for securing wires to..... W. F. Hendershot  
 Fence stretching device. Wire..... A. Adam  
 Fence wire to posts. Device for securing..... O. D. Reeves  
 Fencing tie. Wire..... E. E. Tobias  
 Ferment and producing the same..... G. Johnson et al  
 Fertilizer distributor..... W. J. Elsom  
 Fifth wheel..... J. H. Booth  
 Filing case..... G. B. Burrage  
 Filter. Pressure..... G. W. Durbrow  
 Fire escape..... E. Senn  
 Firearm..... T. C. Johnson  
 Fireman's belt..... M. J. Lovett  
 Fireproof door. Automatically closing..... H. C. Smith  
 Floor scraper..... J. Duda  
 Fluid tempering apparatus..... B. Haynie  
 Fuel. Bituminous coal..... M. Andes  
 Furnace charging mechanism..... D. Baker  
 Furnace grate..... J. Turner  
 Furnace grate..... J. Ferguson  
 Furnaces. Device for effecting complete combustion in..... R. Wilde  
 Fuse. Burning time..... K. Wieser  
 Game and toy..... 2 pats. C. G. Mortimer, Jr.  
 Game apparatus..... T. D. Singleton et al  
 Game apparatus. Educational..... R. W. Maasfeld  
 Garment fastener..... J. M. Steinhart  
 Garment suspender..... A. Hansel  
 Gas apparatus..... L. A. Watts  
 Gas burner..... L. T. Alton  
 Gas consuming furnace for crematories..... F. L. Decarie  
 Gas for extracting tar, water and ammonia. Treating coal..... W. Feld  
 Gas generator..... W. H. Cone  
 Gas igniter. Distant acting electrical..... G. Lentschat  
 Gas lighting and distinguishing device..... R. N. Oakman  
 Gas producer..... W. H. Cone  
 Gas producer..... G. Camoton et al  
 Gas producers. Grate for..... R. Hilbrecht  
 Gates. Trip for automatic..... C. Hocker  
 Gear wheel. Yieldable..... J. A. Brown  
 Gearing..... C. W. Van Vleet  
 Glycerin nitrates. Manufacture of..... A. Mikolajczak  
 Governors. Driving gear for..... F. Reichbach  
 Grain drill..... 2 pats. F. E. Davis  
 Grinding machine. Roll..... W. M. Wilhelm  
 Gun. Automatic..... H. Lehmann  
 Gun. Cartridge extracting and ejecting mechanism..... H. Lehmann  
 Hairs and the like out of bundles. Apparatus for drawing..... A. Dinklage  
 Hanger for garments and other articles..... J. M. Walker  
 Hay press attachment..... S. H. Christopher  
 Head rest..... F. De Foutis  
 Headlight..... F. Buchanan  
 Headlight screen attachment..... F. Buchanan  
 Heating apparatus..... T. Finelli  
 Heating system..... G. Paul  
 Hides and skins. Machine for treating..... H. S. Corwin  
 Hinge..... R. E. McCuen  
 Hook..... A. Feagans  
 Hook and eye..... A. B. Reid  
 Horseshoe..... J. T. Johns  
 Horseshoe. Padded safety plate for..... E. Dargatz  
 Hose. Lady's and child's..... A. A. Farrant  
 Hose. Process and apparatus for manufacturing lined metallic..... E. Witzemann  
 Hose to couplings. Tool for attaching..... E. A. Wilcox  
 Hub box attachment..... N. Harris  
 Ice cream scraper..... C. H. Bradbury  
 Incubator..... A. Schafer  
 Inflated ball..... 2 pats. C. R. Fleischmann  
 Inhaler..... F. E. & A. D. Jousset  
 Inkstand..... 2 pats. F. M. Ashley  
 Innersole for wet boots and shoes and manufacturing the same. Welt..... C. H. Walden  
 Insulator for telegraph and telephone wires..... S. V. Graves et al  
 Iron articles. Making cast..... A. W. Slocum  
 Jar closure..... F. Smith  
 Jar opener..... W. W. Cronk  
 Jewelry box..... W. P. Devine  
 Jointer gage..... J. W. Lindsay  
 Journal box stop..... P. J. Harrigan  
 Journal boxes. Wastesupporting attachment for..... I. S. Patten  
 Reading board and barrel cover. Combined douch..... W. S. Little  
 Knee pad. Pneumatic..... E. G. Gresham  
 Lacing books and eyelets. Machine for setting..... A. Raiche  
 Lamp..... M. E. R. Lane  
 Lamp chimney..... H. M. Webb

Lamp. Electric..... A. Ackerman  
 Lamp. Incandescent..... G. Klumpp et al  
 Lamps. Combined candle base and socket for miniature electric..... J. H. Goehst  
 Lathe tool holder and steady rest..... L. R. Barker  
 Laundry article marking machine..... C. W. Canine  
 Leg rest..... F. W. Flagg  
 Level. Folding..... C. Masters  
 Level. Pinna..... W. A. Sneed  
 Lifting jack..... J. C. Gebhart  
 Linotype machine..... F. Johannessen  
 Liquid dressing. Device for applying..... W. Leonard  
 Liquids from solids. Apparatus for separating..... E. P. Starbird  
 Loading apparatus..... A. Marvin  
 Lock..... E. H. Roy  
 Lock mechanism..... H. G. Voight  
 Lock strike..... H. P. Townsley  
 Locks. Circuit closer for..... A. Glass  
 Looms. Automatic stop mechanism for power..... J. F. Blumer  
 Lubricant..... H. N. Potter  
 Mail box..... G. E. Hasseman  
 Match case..... E. V. Van Deusen  
 Match safe. Pocket..... G. F. Dunn  
 Mattress. Wire..... C. S. Lloyd  
 Measurer. Dry..... A. J. & C. K. Johnston  
 Measuring and mixing device..... E. N. Trumpet et al  
 Measuring device. Tailor's..... A. M. Roland  
 Mechanical movement..... A. F. Victor  
 Milk heating and cooling device..... F. M. Richards et al  
 Mining harness..... J. Poshman  
 Mixing ingredients..... A. O. Nash  
 Moistener. Envelop..... J. T. Dean  
 Mold..... M. Kuller  
 Mold..... G. Penlinger  
 Molding machine..... E. W. Thompson  
 Muffler. Exhaust..... O. Goldman  
 Neck pad..... C. J. Lord  
 Necktie..... J. F. Sweeney et al  
 Needle and pin holder..... F. B. Metzger  
 Nose bag..... C. B. Howard  
 Nut and bolt lock..... B. Bulger  
 Nut lock..... W. H. Harlow  
 Nut lock..... G. W. Jones  
 Nut lock..... C. E. Hill  
 Nut lock..... A. H. Knopf  
 Nut. Lock..... P. E. Bagge  
 Oak. Bow facing..... N. Gagnon  
 Oil cloth cutter..... C. C. Fowler et al  
 Ordinance. Rapid fire..... J. W. Dearborn  
 Ore cyaniding apparatus..... T. L. Rankin  
 Ore hoist..... C. W. Hunt  
 Ore roasting chloridizing or drying furnace..... A. V. Leggo  
 Oven. Baking..... G. H. Petri  
 Packing. Metallic..... G. D. Rollins  
 Packing. Piston rod..... A. L. Shaffer  
 Padlock. Permutation..... R. Gibson  
 Paint..... H. N. Potter  
 Paint displaying, testing and demonstrating device..... C. Shannon  
 Paint. Making..... H. N. Potter  
 Paper hobby horse..... M. Bellian  
 Paper pasting and cutting device. Wall..... M. A. Roberts  
 Paper pulp. Making..... J. L. Coker, Jr.  
 Parer..... T. M. Guest  
 Pencil sharpener..... O. E. Hammond  
 Pencil sharpening device. Lead and other..... H. A. H. Gnh  
 Pens. Valve attachment for fountain..... F. O. Conill  
 Photographic lens mount..... E. Bauck  
 Photographic plate or film holder..... G. Wishart  
 Pianos or musical instruments. Pedal board and pedal for self playing..... W. F. Cooper  
 Pieguard. Pastry..... E. L. Cole  
 Pillow. Cool..... C. B. Hurst  
 Pillow. Sham..... B. F. Cary  
 Pin attachment..... G. W. Fletcher  
 Pipe reamer..... C. P. Arnold  
 Pitching machine..... A. Kleffel et al  
 Plane. Bench..... J. A. Trant  
 Planter. Corn..... L. H. McCormac  
 Planter marker. Corn..... O. B. James  
 Plasterer's float..... O. M. Spangler  
 Plow..... P. F. Freeman  
 Plow rudder..... C. W. Bixby  
 Pointer..... T. H. Costello  
 Potato digger..... O. Knoeizer  
 Potential indicator..... J. B. Taylor  
 Powder container top..... F. W. Murray  
 Power from car axles. Mechanism for transmitting..... D. E. Johnson  
 Press roll feed attachment. Platen..... J. Bruckman et al  
 Presswork recorder..... W. F. Palmer et al  
 Printing apparatus..... L. Schlesinger  
 Printing, developing, fixing washing and drying apparatus. Multiple..... F. S. R. Prentiss  
 Printing machine cylinder..... G. F. Read  
 Printing press. Rotary..... F. M. Turck  
 Pump. Duplex steam..... J. Kofod  
 Pump governor..... N. G. Copley  
 Radiator. Hot water..... F. H. Wheelock  
 Rail..... G. R. Taylor et al  
 Rail joint..... N. P. Walters  
 Rail tie and fastening..... N. P. Walters  
 Rail joint..... A. L. Plimpton  
 Railway crossing gate. Automatic..... C. Hocker  
 Railway crossover..... G. A. Ransom  
 Railway motors and means for mounting the same. Gear case for..... A. Grammont  
 Railway. Multiple speed..... L. McHarg  
 Railway switches and signals. Apparatus for moving..... F. P. J. Pallenall  
 Railways. Means for anchoring and securing flat bottomed rails to the permanent ways of..... A. MacLeod-Carey  
 Rake..... C. F. Paes  
 Razor. Safety..... L. T. Snow  
 Refrigerator. Window..... C. Spadavecchia  
 Resetting switch. Automatic..... S. H. Couch  
 Rifle construction..... C. Hamilton  
 Rifle front sight..... T. A. Watson  
 Rifles. Telescope mount for..... F. W. Mann  
 Rock drill..... C. H. Shaw  
 Roller feed table..... J. W. Gocher  
 Rotary engine..... J. W. Stodders  
 Rotary engine..... J. Rodberg  
 Roundabout..... H. G. Traver  
 Ruffler..... A. G. Lamb  
 Sailing device..... E. V. Planta  
 Sash controlling mechanism..... J. C. Lodor

Saw. Endless chain..... J. Smith  
 Saw. Metal..... H. R. Geer  
 Saw. Metal cutting..... H. R. Geer  
 Scale. Computing..... A. De Viss, Jr.  
 Scale. Suspension bearing..... W. H. Sargent  
 Scale. Weighing..... W. H. Sargent  
 Seal..... L. A. Brown  
 Sealing machine. Bottle..... A. A. Wood  
 Semaphore..... J. F. Webb, Jr.  
 Sewing machine..... J. Bolton et al  
 Sewing machine..... W. Arbetter  
 Sewing machine sewing receptacle. Folding..... E. H. Bolter  
 Shaft support..... S. W. Laubham  
 Sheet metal bending machine..... M. D. Sautier  
 Shoe..... M. V. B. Evesson  
 Shoe..... L. H. Voss  
 Shoe heading machine..... W. B. Keighney  
 Shoe holder..... A. R. Anderson  
 Shoes. Box for tops of..... J. N. Moulton  
 Shovel. Steam..... W. H. Bates  
 Shutter fastener..... P. P. Oum  
 Shuttle. Self threading..... reissue.  
 Silicon. Melting and casting..... H. N. Potter  
 Sketch board..... E. F. Chardier  
 Slicing machine..... E. F. Smith  
 Smoke consumer..... C. R. Blankenbiller  
 Smoke consumer..... R. Brien  
 Snow plow..... K. Wilken  
 Snow plow..... P. Hannagan  
 Sole pattern and sole rounding machine..... J. J. Gillespie  
 Spark arrester..... A. N. & A. M. Holdaway  
 Speed indicators. Circuit closing device for..... H. Dahl  
 Spindle..... H. C. Smith  
 Spreader..... A. Bryan et al  
 Square, bevel and protractor. Combined..... E. H. Long  
 Stackers. Fan for pneumatic..... J. K. Sharpe, Jr.  
 Stall..... C. A. Makowski  
 Stand..... H. Wessels  
 Steam boiler. Oil burning..... T. W. Heintzelman  
 Steering mechanism for self propelling machines..... G. W. King et al  
 Stone. Artificial..... F. Kellen  
 Stone blocks. Machine for making artificial..... A. C. Kynett et al  
 Stovepipe joint..... C. C. P. Lund  
 Stoves. Dustless ash sifter and draft regulator for..... P. Hannan  
 Straw handle. Double..... J. C. McClure  
 Straw carrier attachment..... H. S. Hanson  
 Street cleaning machine..... B. Borden  
 Superheater..... F. J. Cole et al  
 Swing. Circle..... H. G. Traver  
 Talking machines. Safety device for soundboxes for..... L. P. Vanquet  
 Teaching the playing of stringed instruments. Device for..... J. W. Myers  
 Telemeter. Coincidence..... A. König  
 Telephone pay station device and system..... A. H. Dyson  
 Telephone receiver hook..... D. Howard  
 Telephone switch hook..... J. A. Wooten  
 Telephone system..... W. W. Dean  
 Telephone system..... A. H. Dyson  
 Telephone test set attachment..... G. L. Rosenberger  
 Telephone transmitter and receiver. Combination..... C. C. Gichrist  
 Theatrical machinery or apparatus..... A. H. Dyson  
 Threading die..... G. Garnier et al  
 Threading machine..... W. B. Pearson  
 Threading machines. Cut-off head-knatching attachment for..... B. Zich  
 Time element device..... J. G. Sautter  
 Tire for vehicle wheels. Cushion..... L. H. Barry  
 Tire. Wheel..... N. Beckwith  
 Tobacco pipe..... L. Swenson  
 Toothpicks. Mechanism for cutting wooden..... C. P. M. Rounds  
 Torpedo applicator. Railway..... P. F. Sullivan  
 Toy..... C. Ewing  
 Toy..... W. D. Groesbeck  
 Trace connection..... J. T. Bressler  
 Trace fastener..... J. F. Harris  
 Track gage, level, and aligning apparatus. Combination..... E. A. Brown  
 Track laying apparatus. Portable self..... E. O. Rood  
 Treadle. Removable machine..... S. D. Bachard  
 Trolley controlling apparatus..... F. E. Case  
 Trolley pole controller..... J. J. Tarrt  
 Trousers presser and creaser..... H. C. Waibel  
 Trousers stretcher and coat hanger. Combined..... S. B. Bedinger  
 Truck. Breakdown..... F. C. Wheeler  
 Truck. Engine or tender..... T. E. Adams  
 Trucks. Combined bunk and check-block for logging..... I. G. Haywood  
 Tube cleaner..... A. H. Swartz  
 Tuck marker..... 2 pats. A. G. Lamb  
 Tutting apparatus..... B. J. Jacobs  
 Turbine buckets. Means for attaching..... J. G. Callan  
 Turbine. Elastic fluid..... O. Junggren  
 Turbine engine. Steam..... I. F. B. B. et al  
 Umbrella..... C. T. Von Wallmenich  
 Umbrella stand..... T. L. Monaghan  
 Urinal..... L. H. Fleiss  
 Vacuum drier..... E. Passburg  
 Valve..... S. A. Plough  
 Valve controlling device. Gas..... I. C. Peterson  
 Valve for gas supply pipes. Automatic safety..... A. W. Jenczewsky  
 Valve for steam boilers. Blow off..... B. Barnes  
 Valve. Steam actuated..... A. F. Thomas  
 Vanner. Pneumatic..... A. H. Stebbins  
 Vaporizer..... J. E. Var Ness  
 Vehicle. Motor..... E. Chiquette  
 Vehicle propelling apparatus..... A. Ahlbrecht  
 Vehicle running gear..... F. L. Birford  
 Vehicle spring..... 2 pats. C. L. Thomas  
 Vehicle storm top..... W. A. Hunter  
 Vending machine..... R. Z. Bell  
 Ventilating device..... R. Taylor  
 Ventilator grate..... S. Petersen  
 Vessel. Marine..... J. W. Martin  
 Vise and drill. Combined..... P. J. Harrah  
 Votometer..... G. E. Campbell  
 Wagon attachment..... F. C. G. Zimmermann

Wagon brake..... G. O. Doll  
 Wagon brake..... J. K. Ezzell  
 Wagon. Dumping..... F. M. Krasner  
 Wagon seat support. Adjustable..... F. H. Keller et al  
 Walls. Printed frieze for..... H. M. Schmitz, et al  
 Washboilers. Device for removing clothes from..... O. Carlson  
 Washing machine..... R. N. Brent  
 Watch registering and indicating device..... T. H. Watson  
 Water purifying apparatus..... C. L. Kennicott  
 Water softening and clarifying apparatus..... J. L. Zeigler  
 Weed cutter..... J. T. Short  
 Weigher and register. Automatic..... H. B. Ruggles  
 Weighing and bagging machine..... R. G. Scott  
 Weighing mechanism..... C. O. Soderquist et al  
 Welding. Machine for electrically..... L. S. Rolland  
 Well cap..... H. A. Gray  
 Wheel sand box..... L. E. Waterman  
 Whiffletree hook..... J. G. Myers  
 Winding machine. Ball..... F. J. Faulkner  
 Window for banks. Automatic..... G. K. Russell  
 Window ventilator..... S. B. Goman  
 Wire stretcher..... C. A. Miller  
 Wire stretcher..... S. H. Thompson  
 Wire tightener..... L. G. Dunn  
 Wort. Treating and aging..... H. E. Deckebach  
 Wrench..... H. J. Shepherd  
 Wrench..... J. A. Holton

## DESIGNS.

Brush back..... A. E. Hathaway  
 Button hook or similar articles. Handle of a..... A. E. Hathaway  
 Finger ring..... J. L. Herzog  
 Jug or similar article..... C. J. Noke  
 Mirror back..... A. E. Hathaway  
 Refrigerator..... C. H. Boeck  
 Rubber matting..... A. J. Whisler  
 Sewing rack..... W. C. J. Lang  
 Soda water tumbler holder..... G. C. Lyon  
 Spoon, fork, or similar articles. Handle for a..... G. Strohacker

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## MECHANICAL PATENTS.

Advertising device..... H. H. Bell  
 Aerial ferry..... S. B. Harding  
 Aeroplane..... J. J. Montgomery  
 Air. Apparatus for the production of carbureted..... A. Perrier  
 Air brake attachment..... J. B. O'Donnell  
 Air brake system. Automatic..... F. B. Corey  
 Air humidifying and cleansing apparatus..... J. W. Fries  
 Alloy for bearings..... H. Kienauer  
 Alternator. Inductor..... C. A. Kelsey  
 Alternator. Inductor..... D. B. Rushmore  
 Amusement device..... E. A. Faller  
 Animal trap..... J. Campbell  
 Axle. Rotary..... C. H. Faulkner  
 Baling press..... F. A. Ryther et al  
 Ballot box..... K. L. Flenty  
 Bank. Juvenile savings..... W. G. Holmes  
 Barrel carrier..... J. Travel  
 Barrel-forming machine..... M. F. Orest et al  
 Bed bottom support..... H. C. Creedon  
 Bed. Folding..... W. C. James  
 Beds. Head and back rest for..... E. Michaud  
 Bedstead attachment..... E. M. Carpenter  
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 Bottle..... B. Ormerod  
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 Bottle stopper..... G. Kirelgard  
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 Bottle support..... J. W. Barnard  
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 Car coupling..... G. A. Hermanson  
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Car tender..... W. A. Mohr  
Car handle shield..... W. H. Pontius  
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Copy holder..... F. C. Shober  
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 Coat lapel and collar regulator ..... W. H. Cling  
 Coffee or tea urn ..... H. R. Lynn  
 Code. Self testing safety ..... C. J. Mitchell  
 Colander ..... J. Norris  
 Concrete chimney top ..... J. Baumgartner  
 Concrete construction. Anchoring device for ..... J. Schirra  
 Concrete mixer ..... H. Erickson  
 Culinary utensil ..... F. H. Rundell  
 Culvert ..... F. Hummel  
 Cutting die ..... F. J. Lima  
 Damper controller. Time ..... J. M. Wollaston  
 Dash pot ..... F. E. Lammert  
 Dental handpiece ..... C. M. Freeman  
 Denture. Artificial. P. B. & S. J. Lesemann  
 Dining table ..... M. Miller  
 Display device. Picture ..... L. C. Bailey  
 Displaying apparatus. Goods ..... D. F. Burrage  
 Distilling apparatus ..... W. H. Bartholomew  
 Ditching machine for tile, &c ..... G. M. McCleary  
 Door carrying and operating device ..... M. Corsey  
 Door catch ..... H. F. Kell  
 Door hanger ..... G. W. Terrell et al  
 Door hanger. Sliding ..... R. Mobley  
 Door opener. Foot operated ..... J. M. Vincent  
 Door. Sliding ..... W. I. Arnoed  
 Doorstop ..... G. F. Houser  
 Drilling machine ..... 2 pats. B. F. Barnes  
 Drills. Clamping joint for ..... C. W. Gutzzeit  
 Driving and braking apparatus ..... L. T. Gibbs  
 Driving and controlling gear ..... G. T. Hackley  
 Driving gear ..... G. T. Hackley  
 Dumping and elevating apparatus ..... P. J. Manger  
 Dumping receptacle ..... G. Perrine  
 Duplicating roll ..... C. A. Kenworthy  
 Dye. Making a red vat dyeing ..... G. Engi  
 Easel. Knockdown ..... J. Bing  
 Egg beater ..... H. M. Crimp  
 Electric conductors and other wires. Joint for ..... A. Fleeger  
 Electric switch. Automatic ..... H. Leitner et al  
 Electrical conductor connector ..... P. F. Williams  
 Electrostatic apparatus ..... M. Woodsome  
 Electrothermal switch ..... J. Erickson  
 Elevator safety device ..... W. C. Tench  
 End gate and lifting jack ..... O. Bucklin  
 End gate. Wagon ..... M. L. Winaus  
 Engine cooling and lubricating apparatus ..... G. Brown  
 Engine coupling. Traction ..... H. Nilson  
 Engine crank. Gas ..... W. R. Everett  
 Engine shafts off dead centers. Device for throwing traction ..... W. L. Quick  
 Envelop and letter sheet. Combined ..... W. A. Pridmore  
 Evaporator ..... J. L. Smith  
 Fabrics. Apparatus for ungumming silk ..... P. Schmid  
 Farm gate ..... D. Reddin  
 Fastener ..... E. B. Stimpson  
 Faucet drip attachment ..... J. A. Ferguson  
 Feed water heater and purifier ..... H. E. Moffat  
 Fence post ..... M. J. Huber  
 Fence stay ..... C. M. Follett  
 Fence structure ..... E. D. Zinninger  
 Fencing wire stretcher ..... G. Coates  
 Fibrous material. Treating ..... B. C. Mudge  
 Fire escape ..... W. P. Thompson  
 Fire extinguisher. Chemical ..... J. G. Platt et al  
 Fish hook ..... O. Hallstrom  
 Fish hook ..... J. S. Parke  
 Fish trap ..... J. Swart  
 Float ..... C. A. Waldo  
 Flushing attachment. Sink ..... H. J. Holmes  
 Folding box ..... H. B. Drew  
 Frogless switch ..... G. M. Ayles  
 Furnace charging or drawing machine. Heating ..... W. T. Martersteck  
 Furniture. Store ..... J. Garfinkle  
 Game apparatus ..... M. E. Sayre  
 Game apparatus. Card ..... C. M. Atkinson  
 Garment pressing machine ..... J. B. Reologie  
 Garment supporter ..... L. D. & A. C. Powell  
 Garments. Machine for pressing busts and shoulders of ..... W. Eastman  
 Gas burner. Safety ..... F. C. Huber  
 Gas from carbonaceous liquids. Process and apparatus for generating a combustible ..... F. Cotton  
 Gas generating apparatus. Acetylene ..... A. Rosenberg  
 Gas generator. Acetylene ..... L. H. Little  
 Gas pipe thawing attachment ..... J. Zvetina  
 Gas producer ..... A. M. Gow  
 Gate ..... O. W. Potts  
 Gate ..... W. H. Clay  
 Gearing ..... J. K. Koons  
 Girder. Rolled ..... A. Vietor et al  
 Glass sheets. Manufacture of ..... B. C. White

Glass or metal. Machine for dropping powdered fusible material upon hot ..... W. B. Norton  
 Glass. Wired ..... R. A. B. Walsh  
 Governor. Explosion engine ..... J. F. McNutt  
 Governor. Explosive engine ..... H. C. Teel  
 Grain heater and drier ..... P. Provost  
 Grinding machine. Knife ..... A. L. Davis  
 Grinding machines, &c. Clamping device for ..... M. A. Rollman  
 Gun. Automatic machine ..... A. O. von Angez  
 Gynecological appliance ..... J. H. Ballard  
 Hair. Rat for the ..... E. L. York  
 Hame fastener ..... P. C. Brown  
 Hammer. Power ..... G. H. Wadsworth  
 Hand for playing chords. Artificial ..... B. R. Amed  
 Harrow ..... G. Metcalfe  
 Harrow. Disk ..... W. C. King  
 Harvester and shocker. Corn ..... H. Larson  
 Hat hanger ..... C. F. Pettinell  
 Hat holder ..... W. W. Pickens  
 Hat holder ..... H. E. Feldman  
 Hat pin ..... E. H. Surridge  
 Hay rack brake attachment ..... A. J. Baxter  
 Heaters. Piping system for ..... W. P. Hussey  
 Heating apparatus. Hot water ..... J. F. McElroy  
 High speed brake ..... W. B. Mann  
 Hinge. Detachable ..... W. T. Roberts  
 Hollow body ..... 2 pats. C. A. Waldo  
 Hook ..... L. A. Walker  
 Hook ..... E. Pyle  
 Horseshoe ..... C. D. Murohy  
 Hover ..... J. L. Nix  
 Hulling mechanism ..... A. P. Grohens  
 Ice creeper ..... W. R. Jenkins  
 Ice severing machine ..... W. O. Hay  
 Illuminating device ..... A. W. Bentell  
 Incubator ..... I. L. Nix  
 Indicator ..... C. Versteeg  
 Inductive system ..... R. C. Browne  
 Ingots, &c. Device for charging and drawing ..... W. T. Martersteck  
 Inhaler ..... F. B. Murphy  
 Insulated track system ..... A. Morrison  
 Ironing board and step ladder. Combined ..... S. H. Williams  
 Journal box and lubricator ..... A. Byrd  
 Knob attachment ..... M. S. Partrick  
 Label holder ..... D. P. Cory  
 Labeling machine. Bottle ..... S. Fyfe  
 Lamp extinguishing device ..... L. Nissim  
 Lamp support ..... A. Rydquist  
 Lamps. Fixing incandescent ..... J. Levin  
 Last turning machine ..... F. J. Shanley, Sr  
 Launder ..... R. L. Dimmick  
 Ledger and daily balance. Depositor's ..... C. S. Crowell  
 Lifting jack ..... N. Weiler  
 Lighter. Pocket ..... W. C. & C. F. MacDonald  
 Line adjusting device ..... A. S. Hamilton  
 Lock ..... J. Hammesfahr  
 Locking device ..... L. E. Rice  
 Loom. Fancy ..... J. R. Fitton  
 Lubricator ..... J. J. Slagel  
 Lumber jack ..... J. M. Ferriss, Jr  
 Machine tool feeding mechanism ..... F. Muller  
 Mail bag deliverer ..... F. M. Hurley  
 Mail bag receiving and delivering apparatus ..... D. M. Daley  
 Mail matter. Truck for transferring ..... F. E. Baker  
 Massage device ..... B. S. Dean  
 Measuring instrument. Electrical ..... C. Hering  
 Mechanical lubricator. Positive feed ..... M. G. & W. H. Plane  
 Mechanical movement ..... D. Ashworth  
 Metal surfaces. Treating ..... L. J. Crecellus  
 Metals. Electrodeposition of ..... J. A. Nussbaum  
 Milk diluting vessel. Percentage ..... M. F. Deming  
 Mirror attachment for ladies' hats ..... A. P. Day  
 Miter box attachment ..... R. H. Dorn  
 Mixing machine ..... W. J. Judd  
 Mop holder ..... J. A. Benson  
 Mop wringer ..... J. G. McCarthy  
 Motor or engine ..... C. C. Clark  
 Mouse trap ..... W. Kumpf  
 Music strip perforating device ..... H. P. Ball  
 Necktie supporter ..... J. R. Knowles  
 Notch cutting machine ..... L. W. Marshall  
 Nut cracking machine ..... R. E. Woodson  
 Nut lock ..... J. Cookerley  
 Nut lock ..... O. J. Russell  
 Nut lock ..... H. H. Smith  
 Nut lock ..... J. J. Chapman  
 Oak lock ..... C. E. Monroe  
 Oil burner ..... S. M. Morrison  
 Onion picker ..... E. C. Jones  
 Ore feeder ..... F. H. Blanding  
 Ore sizing screen ..... C. E. Ratcliff et al  
 Ovens. Automatic stop mechanism for rotary ..... A. S. Cairncross  
 Package carrier ..... J. W. Clark  
 Packing ..... N. C. Davis  
 Packing device. Rod ..... O. J. Garlock  
 Pail handle ..... O. Roitean  
 Panel board. Electric ..... M. H. Johnson  
 Paper and producing the same. Manifold ..... E. E. Linfoot  
 Paper marking apparatus ..... H. Rehlinghaus  
 Paper or other material. Machinery for cutting and delivering sheets of ..... C. P. Cottrell  
 Pasteurizing apparatus ..... H. E. Weber  
 Pasteurizing process ..... H. E. Weber  
 Pencil sharpener ..... H. F. Hambruch  
 Permutation lock ..... C. A. F. Anroche  
 Phonograms. Duplicating ..... M. Joyce  
 Phonograph ..... 2 pats. W. W. Rosenfeld  
 Phonograph record cleaner ..... H. A. Place  
 Piano sound deflector ..... T. W. Freeborne  
 Picker stick back stop ..... P. L. Peterson  
 Piling. Sheet ..... T. Hill  
 Pipe coupling ..... T. C. Wood  
 Pipe wrench ..... J. A. Smith  
 Planer. Circular ..... D. C. Robinson  
 Plant shield ..... N. L. Clarke  
 Planter attachment. Corn ..... E. D. Fisher  
 Planter. Corn ..... M. Meyer  
 Planter marker attachment. Corn ..... J. C. Liston  
 Plastic material. Machine for molding ..... J. Lovett  
 Plow. Hand disk ..... G. A. Brantner  
 Plows. Means for raising and lowering gang ..... B. H. Stover  
 Plumb bob ..... H. M. Curry  
 Pole. Coupling ..... G. C. Nienow  
 Portable house ..... J. A. Walker  
 Potato digger ..... C. E. Friel  
 Powder distributor ..... C. H. Leggett  
 Power lift sweep rake ..... J. F. Hazel

Pressure regulator ..... 2 pats. A. L. Noone  
 Priming device ..... J. W. Graeme et al  
 Printing press. Oscillating cylinder ..... J. Lutz  
 Printing. Transfer ..... J. F. Thorpe  
 Pulley block ..... A. Porter et al  
 Pump ..... A. E. Pray et al  
 Pump. Liquid measuring ..... G. Yanacopoulos  
 Pump. Rotary ..... H. R. Comly  
 Punch and die press ..... G. H. Bartlett  
 Rail bond ..... F. H. Daniels  
 Rail bond ..... J. P. Clark  
 Rail gage and brace. Combined ..... L. F. Bowman  
 Rail. Guard ..... C. M. Hibbets  
 Rail joint ..... 3 pats. W. P. & S. G. Thomson  
 Rail joint ..... D. J. Snyder  
 Rail joint ..... T. Crane et al  
 Rail protector ..... T. Fenwick  
 Rail system for vehicles ..... T. J. Brockway  
 Railway crossing ..... C. A. Alden  
 Railway crossover ..... E. J. Fogarty  
 Railway. Electric ..... J. Murphy  
 Railway rail joint ..... W. C. Deuberry  
 Railway rail joint ..... W. P. & S. G. Thomson  
 Railway switch ..... W. R. Cochran, Jr  
 Railway switch ..... J. Herrington  
 Railway switch. Automatic ..... R. K. Floeter  
 Railway tie ..... W. R. Cochran, Jr  
 Railway tie ..... J. H. Clark  
 Railway tie ..... A. Heine  
 Receptacle clamp ..... J. A. Reams  
 Recording lock ..... 2 pats. A. De Vilbiss, Jr  
 Reel band. Sliding ..... L. L. Bartlett  
 Refrigerator ..... W. Landry  
 Refrigerator car ..... E. I. Dodds  
 Removable stopper and strainer ..... E. P. Boden  
 Rodent exterminator ..... M. T. Whitney  
 Roll. Hot mill ..... J. Loomis  
 Roll polishing device ..... A. Ridd  
 Rolling plates. Apparatus for ..... A. Ridd  
 Roofing plate. Metallic ..... P. S. Torrence  
 Rotary engine ..... F. S. Sullivan  
 Rubber articles. Hard ..... W. R. Sine  
 Rule ..... H. D. Hagerman  
 Running gear ..... J. W. Gardner  
 Sander ..... G. E. Cummins et al  
 Sander. Pneumatic ..... J. J. Morgan  
 Sash cord fastener ..... E. Belanger  
 Sash cord guide ..... E. B. Miller et al  
 Sash. Window ..... W. M. Taylor  
 Saw frame. Buck ..... J. Givens  
 Saw set ..... E. Wismar  
 Sawing machine. Wood ..... D. E. Franks  
 Scabbard ..... F. A. Bragg  
 Scabbard. Bayonet ..... F. A. Bragg  
 Scaffold machine ..... F. Rudman  
 Scale. Computing ..... J. W. Culmer  
 Scissors cutting guide ..... J. Linden  
 Score sheet or card. Rifleman's ..... E. T. Conley  
 Screen plate ..... A. W. Crawford  
 Seal. Snap ..... E. J. Brooks  
 Selecting and signaling system ..... R. J. Sheehy  
 Separator ..... J. F. Cnstand  
 Shade guide. Window ..... A. B. Rush  
 Shade holder coupling ..... E. F. Pierce  
 Shaft binder ..... C. F. Frazer  
 Shaft. Means for journaling a vertical ..... K. Lohle  
 Sheet feeding machine ..... O. S. Beyer  
 Sheet metal tank ..... A. Hahn  
 Shirt and collar. Buttonless ..... R. Edwards  
 Shoe ..... T. Skerrett  
 Shoe filler package and making the same ..... A. Thoma  
 Shoe polishing machine ..... R. F. Lay et al  
 Shutter worker ..... J. P. Hurley  
 Sign. Illuminated ..... O. Herrmann  
 Signaling systems. Adjustable harmonic ringer for selective ..... J. Erickson  
 Siphon. Automatic ..... G. D. Ackley  
 Skins. Apparatus for cutting dried ..... J. Hemingway  
 Skirt marker ..... A. Waterman  
 Sleeping bag ..... H. E. Moore  
 Smoke bell ..... T. C. O. Sherk  
 Soap drying machine ..... F. H. Merrill  
 Sound record. Magnetic ..... V. H. Emerson  
 Sound recording apparatus ..... T. A. Edison  
 Sound reproducing machine ..... C. A. Smith  
 Spark arrester ..... W. L. Dudley  
 Speed device. Variable ..... G. B. Rossman  
 Speed drive ..... F. M. Chapman  
 Speed regulator ..... G. A. Mosher et al  
 Spring fastening ..... F. Schindewolf  
 Stalk cutter ..... W. C. Stevenson  
 Stamp. Phosphorescent ..... J. W. Aylsworth  
 Stanchion ..... D. D. & W. D. James  
 Steam. Apparatus for the generation of ..... I. H. Boyer  
 Steam boiler ..... C. H. Smith  
 Steam engine ..... E. H. Boockock  
 Steam exchanger ..... C. A. Gilmore  
 Stove. Sectional compound heating ..... W. A. Standing  
 Stoves. Burner valve for blue flame oil ..... J. S. Frey  
 Stovepipe ventilator ..... F. Kallen  
 Straw cutter ..... D. A. & J. F. Stewart  
 Stud. Bearing ..... W. Wilson  
 Superheater ..... F. J. Cole  
 Superheater ..... C. H. Smith  
 Switch operating device. Truck ..... L. Lovoy  
 Switch stand ..... A. Corts et al  
 Switching or telephone system ..... A. E. Keith  
 Table ..... R. Johnson  
 Table ..... A. De Kubber  
 Table ..... E. Mearls  
 Tablet and book cover. Removable ..... S. G. Campbell  
 Talking machine reproducer ..... E. Runge  
 Talking machine sound box ..... L. F. Douglass  
 Telephone attachment ..... W. A. Patterson  
 Telephone or other switches. Interrupter for automatic ..... A. E. Keith  
 Telephone system ..... F. G. Bell  
 Telephone system. Automatic ..... J. Erickson  
 Telephone transmitter arm ..... H. J. Guttman  
 Threshing machine feeding attachment ..... H. H. Bockelman  
 Threshing machines. Beater clearer for ..... O. O. Braaten et al  
 Tiles. Device for forcing terra-cotta ..... J. Elliott  
 Time table. Time operated ..... D. G. Hurd  
 Tires upon vehicle wheels. Means for removably attaching ..... J. C. Schleicher  
 Tongue controller. Wagon ..... L. J. Frogard  
 Tool. Combination ..... I. E. Vanauken  
 Toy ..... C. W. Townsend  
 Track crossing ..... W. Yeatts

Track extension ..... W. J. Cocklin  
 Track laying machine ..... C. O. Wescott et al  
 Trap ..... C. Christianson  
 Trees. Device for nourishing and strengthening the growth of ..... A. Osborne  
 Trolley pole controller ..... J. F. Boggs  
 Trolley wheel ..... W. Livingstone  
 Truck ..... J. N. Snyder  
 Truck loading and unloading appliance. Lumber ..... J. A. Savward  
 Truck. Railway motor ..... G. S. Gundersen  
 Truck wheel check. Warehouse ..... C. Bourque  
 Trucks. Cast metal side frame for car ..... E. I. Dodds  
 Trucks. Falling bolster for lumber ..... F. M. Rattenbury et al  
 Turbine. Elastic fluid ..... C. G. Curtis  
 Turbine. Steam ..... W. F. Limberg  
 Tube corrugating machine ..... E. R. Stasch  
 Tube expander ..... C. D. Hand et al  
 Tubes. Manufacture of compound ..... J. H. Nicholson  
 Typewriting machine ..... F. A. Cook  
 Typewriting machine ..... W. F. Helmond et al  
 Umbrella rib and stretcher connection therefor ..... P. V. Brady  
 Vacuum pan ..... J. Irazqui  
 Valve ..... H. D. Powuall  
 Valve and means for actuating the same ..... E. Morternd  
 Valve. Automatic ..... J. W. Ledonx  
 Valve. Blowing engine ..... J. F. M. Patitz  
 Valve controller. Flushing ..... C. A. Wulf  
 Valve for air brakes. Retaining and recharging ..... C. B. Harrington  
 Valve for fluid pressure motors ..... S. W. Brainard  
 Valve. Gas engine ..... J. L. Bromley  
 Valve mechanism. Engine ..... C. L. W. Trinks  
 Valve stem clamp and lubricator. Combined ..... J. C. Williamson et al  
 Varnishing composition and making same ..... A. E. Nienstadt  
 Vault. Burial ..... J. B. Murray  
 Vault. Burial ..... R. W. Thompson  
 Vehicle ..... W. E. Birket  
 Vehicle shifting rail ..... D. W. Connell  
 Vehicle wheel ..... F. E. Johnston et al  
 Vehicle wheel. Road ..... G. S. Ogilvie  
 Vise ..... H. H. Abernathy  
 Voting booth ..... D. Bruce et al  
 Voting machine ..... W. L. Fenn  
 Voting machines. Grouping mechanism for ..... W. I. T. Fosdick  
 Wagon. Dumping ..... P. Pinto  
 Wagon hounds. Adjustable pattern for ..... M. M. Huyett  
 Wagon standard ..... W. W. Bruce  
 Wagon trains. Gear for directing ..... R. Jonas  
 Washing machine ..... P. P. Ankerson  
 Watch. Antimagnetic ..... H. S. Montgomery  
 Water closet flushing outfit ..... L. Lipp  
 Water craft ..... A. J. & E. A. Suhm  
 Water for use in baths, &c. Carbonating ..... X. Erlinger  
 Water purifying apparatus natural ..... F. Julian  
 Weather strip ..... T. V. Johnson  
 Well drilling machine ..... C. M. McAfee  
 Wheel ..... F. I. Hallett et al  
 Wheel construction ..... F. C. Milliken  
 Wheel lock ..... A. H. Pence  
 Wheel rim. Vehicle ..... F. A. Wilcox  
 Winding machine ..... J. O. McKean  
 Windmill brake ..... F. E. Benedict  
 Windmill brake ..... A. J. Patch  
 Wire drawing drum ..... I. A. Horton  
 Wire stretcher ..... R. Burnham  
 Wire. Trellis ..... H. L. Patthey  
 Wire working tool. Combination ..... A. M. McLeran  
 Wood. Preserving ..... J. T. Logan  
 Woodworking machinery. Feeding device for wort. Fermenting ..... H. A. Schalk  
 Wrench ..... F. J. Holton et al  
 Yoke holder. Neck ..... H. M. F. Leighty  
 Zinc. Electrolytic production of ..... V. Engelhardt

## DESIGNS.

Bag frame ..... K. Oswald, Jr et al  
 Bottle ..... V. C. Bell  
 Curtain. Lace ..... H. Browne  
 Dish ..... J. Williamson  
 Drinking glass or similar article ..... W. Heimer  
 Garment hanger ..... J. B. Reichrode  
 Glass plate ..... N. Franzen  
 Lamp. Gasoline ..... D. H. Chisholm  
 Tiling ..... A. G. Voight

## Canadian Patents.

Canadian Patents may now be obtained by the inventors for any of the mechanical inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated, the cost will be a little more. For full instructions address Inventive Age Publishing Co., 918 F Street N. W., Washington, D. C.  
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### TREATING HOG CHOLERA.

#### New Method Discovered in the Agricultural Department.

A patent has been issued to Dr. M. Dorset of the bureau of animal industry of the Department of Agriculture covering a new method for the treatment of hog cholera. The process consists of the injection of serum from the blood of an immune hog instead of the present method of inoculating the hog directly with the cholera virus. By this direct inoculation method about 20 per cent of the hogs treated have been killed. As the loss from hog cholera in this country amounts to about \$15,000,000, and has averaged that for the past five years, it is plain to see that a satisfactory remedy is a matter of great importance to the farmers.

The method has been patented merely to protect it, but has been thrown open to the farmers of the country by Dr. Dorset without price for royalty. Dr. Dorset has been working on this matter for several years in connection with Dr. W. B. Niles and Dr. C. N. McBryde of the bureau of animal industry.

#### Cheap Gas for Balloons.

The more general use of balloons for military purposes, as well as the growing interest in air ships, renders of importance a new method of producing hydrogen gas which has been discovered in France. It is a process for the manufacture of hydrate of calcium a product which by reason of its convenient fertility for the generation of hydrogen gas, is likely to play a serious role in the field of applied chemistry. By means of electricity, calcium metal is produced on a commercial scale, at a price so moderate as to permit its use for various industrial purposes.

The invention consists in a process by which the reaction of metallic calcium, upon a metallic salt produces the new form of hydrate of calcium, or as it is commercially known, "hydrolithe." This resembles in appearance and qualities calcium carbide, which is used in the manufacture of acetylene gas. The difference is that whereas the carbide with the addition of water evolves acetylene, the hydrolithe upon contact with water produces hydrogen gas.

This new product is safe and easy to handle, can be used for generating gas wherever water can be obtained, and for long flights in balloons, can be carried as ballast instead of sand, and employed at will for refilling the balloon, which may thus be kept in flight almost indefinitely. As an illustration of the economy of weight that has been accomplished by the substitution of hydrolithe for the purposes of military balloon service, it may be stated that an ordinary field balloon contains, when inflated, about 550 cubic yards of gas, the generation of which by the means hitherto employed requires the employment of materials and apparatus which fill three wagons, each one of which weighs when loaded three and a half tons, and requires in a campaign to be drawn by six horses. All

this cumbersome and costly equipment can now be replaced by two-horse wagon carrying a ton of hydrolithe, which with the addition of water that can be obtained anywhere, supplies instantly and in controllable quantities whatever gas may be required.

#### Glass Making Machine.

Visitors to the last World's Fair were shown, in the Belgian exhibit, samples of glass that could be hammered and bent without breaking. The process of making this rare quality, however, involved so much expense that specimens of it will only be regarded as curiosities for some time to come. A more practical discovery has recently been made in the same country, which promises to greatly reduce the labor necessary to produce glass, by substituting machine for hand work. So far, two methods have been mainly employed in the manufacture of crystal plate glass and mirror and window glass, namely, that of casting and blowing. In making window glass, the molten substance has been blown into cylinders by glass makers pipes, and subsequently flattened, while in the making of plate glass, the viscid mass was cast from the pots and rolled. The new invention draws the molten substance from the pot and conducts it between rollers lying side by side. Seventeen pairs of these rollers are built up towerlike above the pot. The liquid mass cools on its way between the rows of rollers, and comes out from them polished on both sides, beautifully flattened and ready for use. Any desired thickness can be given to the glass, as this can be regulated by the relative position of the rollers.

It is believed that this invention will bring about a revolution in the trade. One result will be that the manufacture of plate glass of the smaller sizes will undergo an entire change, as it will in future come chiefly within the scope of the furnaces. A syndicate of European manufacturers has bought the invention, and it is reported that the price paid was in six figures. If it works as anticipated, it will cause a much greater extension of the industry, at the same time throwing many skilled workmen out of employment, as it will be impossible for the glass blower to compete with a simple and cheap process of drawing out the glass mechanically.

#### Bark Cloth.

The recent visit at Barmen of a resident of New York City, who has discovered the wide possibilities of a native product bark cloth, has exerted a lively interest among importers, manufacturers, and the German government.

This product is a bark peeled from an east African tree, and pounded by the natives into a cloth in pieces of from 2 to 2½ yards in width and 4 to 6 yards in length. The tree is of the genus "fiscus," and grows, it is said, in inexhaustible quantities all over central and east Africa. The most interesting feature of the bark seems

to be the good spinning possibilities of its fiber. Although the staple is rather short, there is no reason why it should not spin and make an admirable mixture with wool for felting or other purposes. The crude bark can be treated so as to yield the fiber readily without injury.

As the tree in question can be easily propagated and is not killed by stripping off the bark, but permits this process for fifty or more successive years, it is readily seen that this bark product will become a commodity of considerable possibilities.

Head coverings for men and women of all shapes and kinds made from this cloth are much lighter than straw or other material and of much greater porosity. The cloth can be trimmed like silk, muslin or velvet; can be dyed in any color, and would answer for uniform caps or helmets for summer wear, as it can easily be waterproofed. It is blocked into any form and stays in shape, and when cemented two thicknesses crosswise it makes a cloth of great strength. In this form it is very suitable for matting for summer cottages, and could be printed or stamped in all styles. It would also be an excellent and cheap substitute for burlap for walls.

#### A Deep Mining Shaft.

It is an interesting scientific fact that nothing that falls from the mouth of the deepest mining shaft in the world ever reaches the bottom. This has been demonstrated at the Big Calumet and Hecla copper mine at Calumet. The article, no matter what shape and size it may be, is invariably found clinging to the east side of the shaft.

The discovery was made through the accidental dropping of a monkey wrench into the deepest shaft. Instead of falling to the bottom, it was found lodged against the side, some hundred feet or so down. It was decided to make a careful test of the apparent phenomenon. A small but heavy spherical body was thought to be the best for the experiment, and a marble, tied to a thread, was suspended about 12 feet below the mouth of the shaft. When the marble was absolutely still, ensuring that it would drop straight down, the thread was burned by the flame of a candle. The marble fell, but at a point 500 feet from the surface brought up against the east wall of the shaft. The same would be the case were a man to fall into the shaft. While it would mean sure death, the body would be found lodged in the timbering on the east side.

Members of the faculty of the Michigan College of Mines are experimenting to obtain data as to the thickness of the earth's surface. The shaft above described possesses advantages for furnishing the required information that are presented by no other place in the world. The deep shafts in other parts of the country and in foreign lands usually begin at an altitude and end little below the sea level; while the Calumet shaft starts at a low altitude and pierces the earth's crust deeper and further below the ocean level than any other in existence.

#### Faster Than Express Trains.

When scientists desire to find out how fast a certain bird flies it is necessary only to set up poles and note by stop watches the time the bird requires to cross the interval. The speed of fishes is more difficult to ascertain. Nevertheless, estimates have been made, showing that the mackerel, considering its handicap in size, comes close to being the champion racer. It travels at times as fast as an express train at high speed—say at the rate of 60 or 70 miles an hour.

Other things being equal, the larger the fish the faster it swims, just as the huge steamship is able to travel at a speed much greater than the little harbor tug. The energy employed by a fish of great size, such as a 30-foot shark, when moving through the water at its best gait, is something tremendous. An ordinary tug, which represents a maximum of energy and a minimum of bulk, utilizes about two hundred horse power. Of course it is only a guess, but it would not seem to be over the mark to suppose that a 70-foot whale makes use of five hundred horse power when it propels its huge bulk forward at a rate of thirty miles an hour. A whale, which is a mammal and not a fish, might be compared to a freight train if the shark is a cannon ball express, but it can beat the fastest ocean greyhound in a speed contest.

The tarpon is probably faster than the shark. It is believed that a tarpon in a hurry can travel at the rate of eighty miles an hour.

#### Alcohol as a Fuel.

We have in ethyl alcohol an ideal fuel,—colorless, limpid, of moderate boiling point, about 50 degrees below that of water, non-freezing, burning without smoke, mixing with water in all proportions, and, therefore, its flame extinguished by water, cleanly, drying off completely when spilled, not attacking rubber gaskets or packings, and non-corrosive for metal tanks and holders.

The fact that its flame is bluish, or so-called non-luminous, means that the flame is almost devoid of free carbon particles, with their intense heat-radiating power, a fact of considerable importance. When gasoline or heavy oils are burning, the flame, loaded with free carbon or soot, radiates heat to such a degree that it is not possible to approach near the conflagration, and combustible surroundings are readily fired by pure radiation of heat.

The production of alcohol on a large scale is very simple, and the raw materials already exist in considerable variety. All saccharine or starchy growths are available. Saccharine wastes are now largely used in Cuba for alcohol production.

This alcohol will, in a properly organized engine, equal, volume for volume, gasoline now sold at a much higher price, in producing power. Even in the immediate future, then, it is evident that alcohol has a large field of usefulness. The farmer need not depend on wood, coal, or oil for his power. His agricultural wastes will furnish it. His fields need only receive the sunshine, and be given sufficient water, and thence any crop yielding starch or sugar, however unmarketable otherwise, may be made the source of power, light, and heat.—Elihu Thomson, in *Cassier's Magazine*.



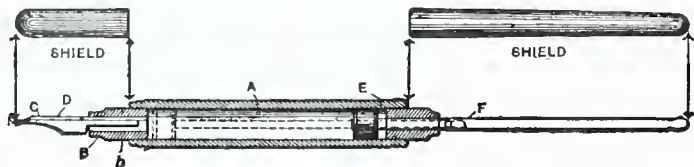
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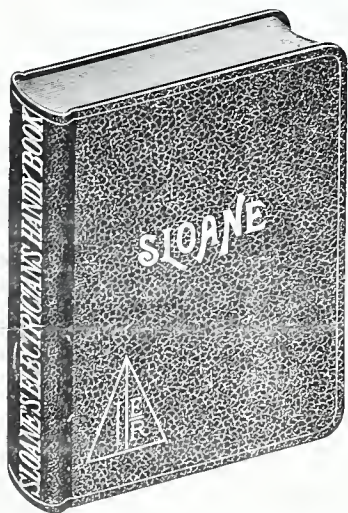


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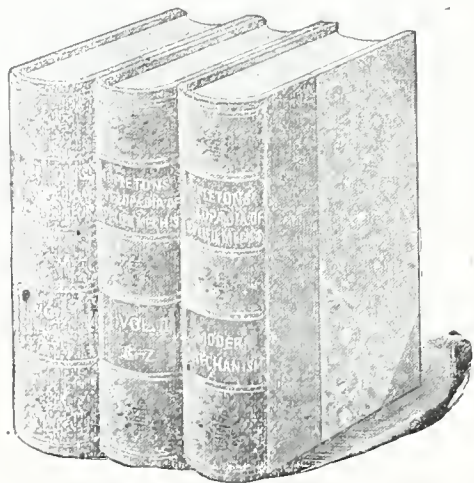
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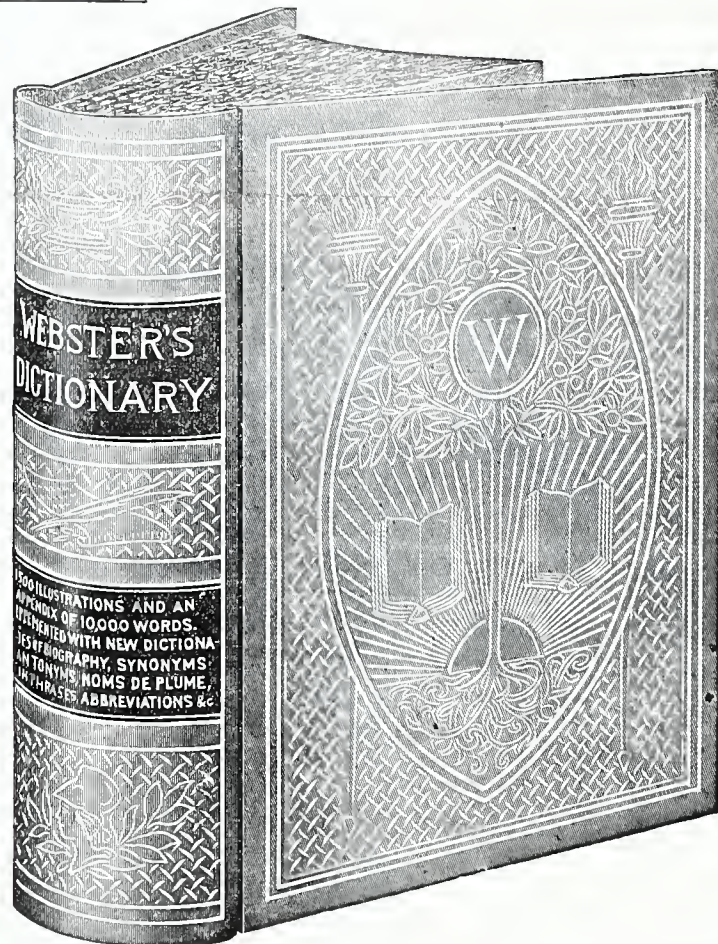
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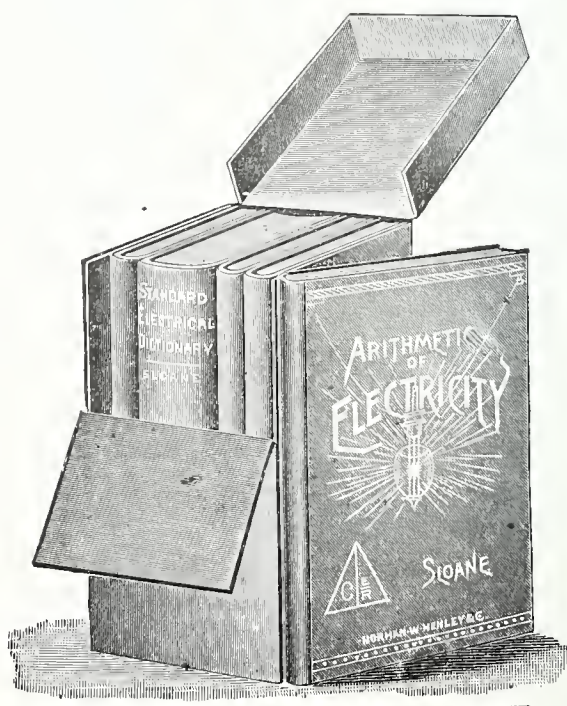
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## THE AUTOMOBILE ON THE FARM.

WITH the revulsion in favor of the simple life, and the movement "back to the soil" which has characterized the early years of the twentieth century, has come a corresponding increase in the respect paid the farmer. When it is remembered that all wealth—food, clothing, shelter and luxuries—must be produced directly or indirectly by the application of labor to land, the dignity of farming will be realized. One reason why this occupation has never before been accorded its due place, is that it is among the last to have been reached by the mechanical revolution which this age has witnessed. In almost every other industry of importance, the machine has taken the place of hand labor; but up to within a very few years, the farm hand's life was one of plodding toil. True, there have been improvements in the designs of plows, of harrows, and of other tools; but a man has had to follow in the furrow behind the slow horses, or patiently to hoe the soil. The second in value of our great crops, cotton, is tediously picked by hand. This fact, together with the isolation of farm life, has been at the root of the prejudice with which it has been regarded. But conditions are changing in farm communities, as well as in the centers of industry. The telephone and the rural free delivery system have done much to relieve the isolation, and the automobile promises to effectively lessen the labor of man and beast.

An automobile plow has been used with success in the Middle West. Although a great advance over horse traction, since it can move much more rapidly, it still leaves something to be desired, as it does not obviate the necessity of following the plow on foot. Far more satisfactory is the apparatus shown in the illustration, where thirty feet of gang plows are being pulled by a 60 horse-power

stretches of prairie land in the West; but even on the small farms of the New England States and along the Atlantic seaboard, farmers are combining to use similar devices on a smaller scale, and find it more profitable than individual toil.

As another example of the prodigious amount of work that these motor farming machines can accomplish, there is a harrow that covers

Ponderous combined harvesting and threshing machines, drawn by automobiles, cut, thresh, clean and sack the wheat, all at the same time and almost without human effort, at the rate of 100 or 125 acres of grain a day. The "cut" of the sickle is from 30 to 40 feet. Such are a few examples of the great service which the automobile renders to Western farmers.

For logging and lumbering, the traction automobile proves itself quite as efficient as for extensive farming. These heavy machines, however, can not be used to advantage on very hilly land, or in fields full of stumps and stones. On small farms, they are of course impracticable. To utilize them, the fields must be moderately level, fairly well adapted for agriculture, and in quite large tracts, such as the prairies of the great wheat belts. But it is not necessary that all automobile farming should be done on a gigantic scale. Smaller machines can be used to advantage, where the land is not adapted for large motors.

In Texas and a few other grazing states, the automobile has been put to

a still more novel use. It is taking the place of the cow pony. Not a few owners of large cattle ranches use it for herding. It runs over the prairie at a wonderful speed, and the cattle soon learn to heed its toot.

In short, the automobile promises to be as important in country districts as it is already in our cities, and the farmer of the future may ride in his motor car as often as the most enthusiastic tourist.



A 60-HORSEPOWER STEAM ENGINE PULLING THIRTY FEET OF GANG PLOWS WITH SEEDERS IN FRONT, AND HARROWS BEHIND THE PLOWS. IT AVERAGES EIGHTY ACRES A DAY.

engine. Seeders are located in front of the plows, and harrows are fastened behind them. This apparatus moves at the rate of three or four miles an hour, and turns over 80 acres of soil a day; or, under good conditions, ten or twelve acres per hour. It thus performs work which ordinarily requires 40 or 50 teams and the labor of many men. Naturally, such enormous machines are adapted only to the broad

100 feet in width, and is capable of harrowing 300 acres a day, or 30 acres an hour. Special gang plows that plow ten inches deep, disk harrows that pulverize the toughest of our clay soils, press drills that cut to the depth of nine inches and seed at the same time, are all successfully operated by these powerful automobiles.

When the grain is ripe, the harvesting is done on a still larger scale.



### Machine Made Bottles.

That necessity is the mother of invention is well illustrated in the cases where the lack of hand labor leads to the use of new mechanical devices to replace it. Strikes have done much. (especially in countries that are older and more conservative in the adoption of machinery than our own,) to facilitate the introduction of new apparatus. One of the most interesting examples of this is in the case of glass bottles, which were formerly blown by the human breath, but are now made by a machine worked by compressed air, the operation of which is of sufficient novelty to justify a description.

The apparatus rests on an oblong pedestal, and consists of a primary mold, in which the shape of the bottle is roughly made: a cup-shaped mold which permits a part of the glass which it contains to solidify: a finishing mold; a mold for the neck and mouth; a pipe for supplying compressed air; and a reservoir for the latter, which is large enough to supply a number of machines.

The liquid glass is transferred from the furnace to the machine in the old manner, and when enough has fallen into the measuring mold, the operator cuts the rope of molten glass with shears. He immediately applies the compressor and permits the air to exercise its pressure from above. This causes the liquid to descend into the neck of the mold and to form the mouth of the bottle. Immediately he reverses this mold, permitting the liquid mass to flow away. He then opens the mold and the bottle is seen suspended by the neck. The glass being still in a liquid state, elongates, and by contact with the oxygen in the open air, a sort of spontaneous combustion is produced, which gives to the glass its brilliancy.

When this primitive, bag-like bottle has extended to a sufficient length, it is enclosed in the molds necessary to give the desired consistency to the lower part of the bottle, where the temperature of the glass is considerably higher than in the upper part. It is here that the cup mold comes into play, and compressed air under weak pressure is introduced. Finally the bottle is inclosed in the finishing mold, where the strongest air pressure is permitted to play in its cavity, pressing the liquid air against the walls of the mold with such force as to smooth out all unevenness or roughness of the surface.

The distribution of the air to all parts of the interior is such that the bottle's thickness is practically uniform in every part of its body. The bottom is next shaped, and the new bottle, perfect in form, is put away in a surface to be cooled under conditions which will produce in the glass the greatest possible tensile strength.

One large bottle factory has twenty such machines in operation. The furnace which supplies them contains 300 tons of molten glass. They are capable of producing 35,000 bottles in twenty four hours.

Machine made bottles are much better than those blown in the old way, as the glass is more evenly distributed in various parts, and there is not the same danger of breakage. Indeed, it is estimated that this has been reduced from a loss of 30 bottles per 1,000 to less than 3 per thousand. The bottle has also a more perfect regularity of form and capacity. The method is also much more economical, and has sanitary and hygienic advantages.

### USES OF THE GRAPEVINE.

NEXT to corn, which is said to be the most versatile member of the vegetable kingdom, perhaps no plant is used in so many ways and for so many purposes as the grapevine. Since the days of antiquity, when to dwell beneath the vine and fig tree was considered the emblem of domestic peace, the grape has been cultivated. Few plants thrive under such varied conditions, or respond more quickly to care. Thus, we find certain forms of it in the natural state aspiring to overtop the monarchs of the forest, and single plants overspreading areas hundreds of feet in circumference, while other forms are grown as mere bushes, a few feet in height, yielding crops ranging from 2 to 20 tons of the finest fruit to the acre.

We enjoy the grape in its fresh state, or when dried, in the form of raisins. The unfermented juice and wine are important items in household economy and medicine, while from the grape many other products and by-products are made. The vine, aside from

The wood and branches are used in the manufacture of baskets, rustic furniture, bark for tying material, etc., and when burned furnish potash and salts. The wood of the grape is of the most lasting nature, and very beautiful in its texture. The great doors of the cathedral at Ravenna are made of vine planks, some of which are 12 feet long and 15 inches broad.

The fresh fruit, aside from being palatable, is believed to possess curative properties, and the "grape cure" is recommended to those suffering from nervous troubles. Wine, vinegar and brandy are familiar products of the grape; but it is not so generally known that it can also yield a very superior syrup. The juice is evaporated to as near a solid substance as possible and shipped thus, thereby reducing to a minimum the cost of transportation. After arriving at its destination, the syrup can be brought back to any desired thinness by the addition of water.

The utilization of the wastes of



LARGEST GRAPEVINE IN THE WORLD.

affording shade, can be used for various medicinal purposes, and the wood is employed for fuel and in the manufacture of furniture. In fact, there is no part of the vine or its fruit that has not proven of value for one or more purposes.

In Switzerland the leaves are applied to surgical uses. For cuts and fresh wounds they are esteemed a sovereign remedy. Decoctions of the juice of the leaves are used in poultices; and an agreeable tea can be made from them which is said to greatly strengthen the nerves. In its use, more sugar is necessary than for tea from the tea plant. The "tears" of the vine—a limpid exudation of the sap at the time the plant begins budding, or in places where it has been wounded—are prized for medicinal purposes. The liquid is collected by cutting off the ends of the canes, bending them down and sticking the ends into the neck of a bottle, which will be filled in a few days.

the grape has long been a profitable industry. After wine is made, the pomace is distilled and a product called pomace brandy is made from it. Pomace from stemmed grapes makes excellent sheep and cattle feed when salted slightly and stored in silos. After the acids are neutralized in them, the pomaces are excellent manure, being rich in potash and nitrogen. Acetic acid may also be obtained from dried pomace.

From the dried grape stems, paper is made, and from the hulls tartaric acid is extracted. The seeds are fed to horses, cattle and poultry, the same as grain, and are said to be even better than oats. Ground up, they are used as a substitute for coffee; they also yield a high-grade oil, which can be employed as a substitute for olive oil. This product can be utilized in the manufacture of a superior soap. Tannin, useful in tanning, is likewise obtained from the seeds.

Wine lees—the sediment in the

casks in which new wine is stored—are valuable on account of the cream of tartar and calcium tartrate they contain.

Aside from all the economic purposes enumerated, vines are often cultivated for ornamental reasons, owing to their beautiful foliage and longevity. The age of the vine is unknown—some authors stating that it equals the oak. California, where the grape industry is of large importance, boasts a vine that is said to be the largest in the world. Beneath its spreading branches (see illustration) which cover nearly half an acre, 800 persons can find protection from the sun's heat. The trunk is nearly 8 feet in circumference. This was planted only about sixty years ago, and the present generation will doubtless see a notable addition to its size.

### Electric Derrick.

A large magnet is used in steel works in Cleveland, to lift iron and steel. It consists of an iron disk supported by chains which may be fastened to the hoop of a derrick or crane block. To the top of the disk is applied an electric plug device, connected with insulated wires, which by an ingenious auxiliary pulley arrangement, are led to a controller at some convenient point at the base of the derrick or in the operator's cab of the crane. The magnet is lowered over the material to be lifted, and enormous loads are gathered and held as long as the current remains connected. Different forms of the disk are made for handling pig iron, heavy melting stock, such as crop ends, butts, castings, tin scrap, bolts, nuts, punches, rivet spikes, rail ends, machine borings, flats, sheets—in fact, almost any form of iron or steel which affords a surface sufficiently large for the magnet to act upon. When the material has been carried to the place where it is to be deposited, the current is turned off and the magnet at once releases the load. Scrap tin has always been an inconvenient material to handle satisfactorily, but by this device it may be disposed of as rapidly and as easily as heavier stock.

### New Treatment of Iron.

A new process for converting ore into iron and steel by a continuous treatment is said to effect a saving of 25 per cent in the manufacture. The ore is simply concentrated by ordinary methods, or if it is magnetic, it is separated electrically until the pure oxide of iron is obtained. The oxide of iron is passed through a revolving cylinder heated by waste gases from subsequent operations and brought in that cylinder to a dull red heat. It drops from the cylinder to a second similar cylinder, and in the latter it is brought into contact with the deoxidizing gas, which is forced through, and brought into contact with the heated ore, thus converting the latter into a pure iron. Accompanied and protected by the deoxidizing gas, it is passed into a third chamber or melting hearth, where it falls into a bath of molten iron and is converted directly into steel or malleable iron.

The whole process being automatic, there is a great saving in time and labor. The new method produces steel from one operation, instead of using the blast furnace and converter.



## A NEW SCHOOL OF DECORATIVE, INDUSTRIAL AND FINE ARTS.

THE first practical effort towards the Greater Washington industrially, which movement has been so much discussed in the journals of the National Capital, has been inaugurated by a group of three women who have established the Washington School of Decorative, Industrial and Fine Arts at 1425 New York Avenue, Washington, D. C.

At the World's Fair, held in St. Louis, the crowds that visited the German exhibit were enchanted by the "German House," decorated and furnished with the work of the art industries and designers of Germany. At the close of the Franco-Prussian war in 1871, the German nation, though elated by their victory, was much impoverished. The first effort of the nation was to establish its manufactures and art industries on a better basis. Industrial art schools were established, training schools for the German youth in artistic designing and kindred pursuits. The result of this was seen by all nations at the World's Fair when the German exhibit was pronounced the finest in the entire exposition. No nation can equal Germany in its colored lithography and wall paper and wall decorative designs. All the finest colored postal cards are made in Germany. Much of the best furniture and jewelry designing comes from that country. Industrial art has made Germany famous among the manufacturers of the world. And the term "it looks Dutchy," which used to mean any thing crude and in bad taste as to arrangement and design, now would express the height of artistic excellence.

In a periodical such as THE INVENTIVE AGE, a brief account of this new Washington school and its aims is appropriate, so closely allied is invention with the arts.

The idea of the school originated with Mrs. Anna Bogenholm Sloane. She is a native of Sweden, and a graduate from the Decorative and Industrial Art Teacher's Training School at Kristinehamn; also from the Sloyd Teacher's Normal Seminary at Naas. Coming to Washington from Chicago where she had been engaged in the arts and crafts work, she decided that Washington was the place of all places to build up a school of Decorative and Industrial Art, together with a national exhibit to which artist-artisans from all parts of the country could send their work for exhibition and sale.

Mrs. Sloane was fortunate in meeting with two women who were considering the establishment of an art school on the latest ideas, with a department of design for practical work. Finding that their ideals and hopes were one, the three ladies, rich in preparation and enthusiasm, united their efforts, and the Washington School of Decorative, Industrial and Fine Arts is the result.

Of course the school is in its infancy, but it is a promising infant and has all the beautiful possibilities of the child in the cradle. It will be

nourished, encouraged, and supported by patronage and interest until it becomes a truly glorious youth, gains the full stature of manhood, and sends its graduates out over the country to build up its art and art industries as Germany has done.

Believing in the people of Washington first, (for the city must respond before the country outside can give much support,) and also believing in some individual members of the great congressional colony which fills Washington during so large a part of the year, these ladies are giving an object lesson in the use and needs of such an institution in Washington.

Underneath all industrial art and designing is the foundation of art training. This course under Miss Berta Hanson will be as thorough as any art school in the country can give. Instruction in drawing from cast and life composition, illustrating, oil painting, water-color and pastel painting, are all included in the course. Miss Hanson is very recently from the Ecole des Beaux Arts. She was one of the women admitted out of a class of seventy-six who took the examinations in the spring of 1902. Miss Hanson has also studied in Madrid, in Antwerp, at Amsterdam and the Hague, Holland. Before going abroad she held the position of teacher of water color and antique in the Corcoran School of Art, Washington, and was a member of the society of Washington artists.

Miss Mary A. Kirkup is at the head of the Department of Design. A complete art training is absolutely necessary for a well equipped teacher of design. This Miss Kirkup has had, both in this country and abroad. She is also a graduate in form study and design of the Teachers' College, Columbia, New York City. This course in design includes much training in drawing, in water color painting from nature, and in composition.

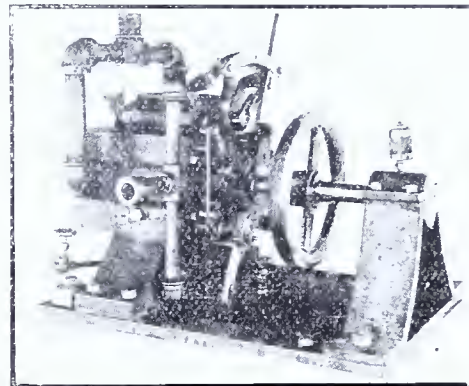
There is no branch of decorative art in which some knowledge of designing is not desirable. And with the rapid industrial development of the country there is an increasing demand for applied designing and drawing, rich in remunerative possibilities to skilled artists. As a means to intellectual development and poise, a course in designing is of exceptional value. Good taste, which has been called "discriminative appreciation," and the exercise of the creative faculty of the mind are directly fostered by such a course. Study of the principles of design clarifies ideas and informs the judgment. Appreciation, cultivated by the study of designing, gives an intelligent pleasure to the observation of good things, intelligible pointedness to the criticism of bad things, and directs to the correct exercise of discriminative selection.

The department is on a practical basis, and from the very first lesson the student is taught to prepare designs in a manner that would make them practical for industrial uses.

Mrs. Sloane's department of Arts and Crafts includes instruction in porcelain painting, art weaving, lace making, wood carving, art needlework, leather sculpture, pyrogravure, wood sloyd, and Indian basketry. As soon as the school enlarges, metal work and book binding will be added to the "Arts and Crafts" department.

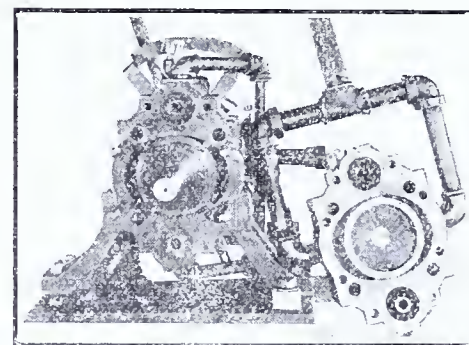
## A NEW ROTARY ENGINE.

Revolution in the use of steam as a power agency is predicted for the rotary engine invented by H. I. Call of Spokane, Wash. The idea embodied in the Call engine is absolutely different from that of the ordinary reciprocating piston engine. There is no piston. Instead there is a steam chest, inside of which is a cylinder, which rotates by pressure of steam against slidable blades, power being made available by a shaft attached to the rotary cylinder.



CRESCENT ROTARY ENGINE READY FOR OPERATION

The cylinder is readily rotated by the pressure of steam against the projecting ends of the sliding blades in the crescent-shaped steam chambers. As the cylinder revolves, it constantly slides the blades back and forth through the arc-shaped slots holding them into the cylinder. The sliding movement of the blades corresponds with the pressure of the oval inner wall of the steam chest upon the points of the blades. When one end of the blade is passing the narrowest distance between the cylinder and the steam chest wall, the other end is passing through the widest distance in the crescent shaped steam chamber. The ends of the blades are fitted so tightly against the wall of the steam chest that not an atom can come between them. To reverse the engine, steam is admitted through opposite valves, the exhaust escaping through separate pipes.



EXHAUST CHAMBER REMOVED.

Mr. Call has completed two of the new model engines. One of them is running in his shop in Spokane. It shows remarkable strength, operating several large lathes, drills, saws and other heavy machinery. The engine is 6 x 7 x 11 inches, and occupies a floor space 15 x 20 inches with its fittings, with 14 inches to the top of the steam pipe, and weighs 217 pounds. It was built with a steam expansion area of six horse-power, but Mr. Call declares he has developed 10-horse power. With one hundred pounds of

steam it has attained 1000 revolutions a minute.

Mr. Call has formed the Crescent Rotary Engine Company, and has secured patents on his invention in the United States and England, as well as other foreign countries. It is proposed to build a \$25,000 factory for its manufacture.

C. M. Fasset, J. M. Fitzpatrick and Samuel Glasgow, members of a special committee appointed by the Spokane chamber of commerce, have made a report to that body in which they say the engine is a great improvement over the reciprocal steam engine, and that because of its cheapness, simplicity, compactness, easy control of speed and reversing, and freedom from vibration, the demand for it should be enormous. They also recommend the engine to the manufacturers of Spokane, and endorse the project to manufacture it in Spokane.

## New Electric Lamp.

The reason why incandescent gas-light is cheaper than electric light, as is well known, is because the filament wires of the latter are very expensive, and the glass bulbs soon wear out. There has now been invented a substitute for the filament. Common metals are combined in a plastic mass, which can be handled like clay, and hardens when dry into a substance resembling stone. From this mass tiny wire threads are shaped which are of uniform thickness and of great homogeneity. The new lamp, it is claimed, needs hardly one fourth of the current which the ordinary electric light requires. The intensity of the light remains the same, the bulbs never becoming black. The lamp can burn 3500 hours at a stretch.

## Heat Opaque Glass.

An Austrian inventor is reported to have made a new kind of window glass, whose chief peculiarity is that it prevents the passage of about 9-10 of the heat of the sun's rays.

It is well known that ordinary window glass allows nearly all the heat derived from the sun to pass through, but on the other hand intercepts heat coming from non-luminous sources, such as a stove or the heated ground. This is the reason why heat accumulates under the glass roof of a hothouse.

If covered with this new glass, a hothouse would, it is claimed, become a cold house, as the heat could not enter. For the same reason a house with windows of this glass would remain cool in summer.

## Big Plants for Tiny Products.

At the time when Adam Smith was writing his "Wealth of Nations," an English workman made a dozen pins and called it a day's work. Today, a census of pins in the United States alone will show that about twelve billion new pins are made and sold every year.

A pocket rule, at that time, was made by a twenty dollar plant and cost a dollar. Now it is made by a hundred thousand-dollar plant, and costs ten cents.

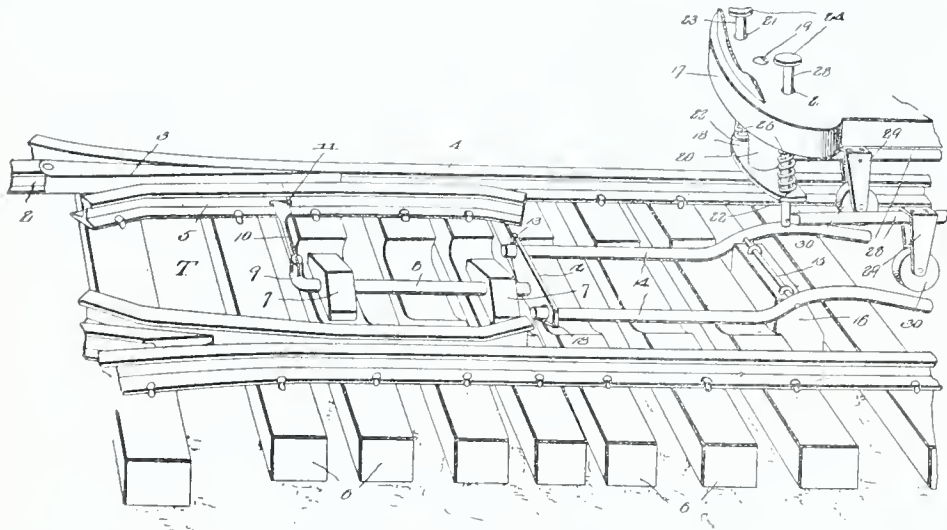


## CLEVER NEW PATENTS.

SWITCH OPERATING DEVICE.—FERTILIZER DISTRIBUTER.—AUTOMATIC FEEDING MECHANISM FOR THRESHING MACHINES.

### Switch Operating Device.

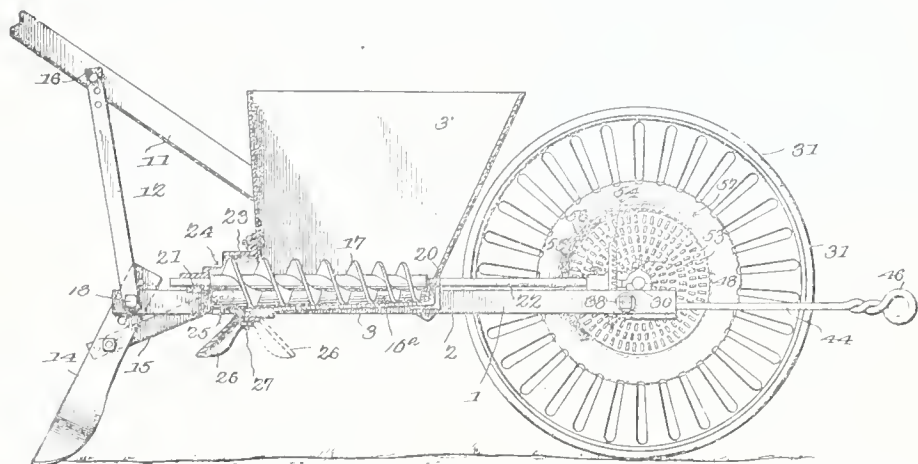
Novel switch operating mechanism, by means of which a switch may be actuated by the motorman of an approaching car, has been patented by Mr. Thomas J. Callahan, of Lynchburg, Va., who has assigned a one-half interest in his patent to Mr. John R. Wingfield, of the same place. The switch includes a pivoted tongue 3, and a rock shaft 8 which is arranged longitudinally between the tracks, and has a crank at one end provided with a link connection 10 with the tongue. The other end of the rock shaft is provided with a cross arm having openings in which are arranged the ends of a pair of levers 14, that are fulcrumed between their ends and are disposed longitudinally between



the tracks. Upon the under side of the car platform are pivoted a pair of arms 23 having depending stirrups, in which are journaled rollers 30, that are arranged to engage the levers. Vertically movable treadle rods 24 extend upwardly from the arms through the platform of the car. The motorman, therefore, has only to press one or the other of the treadles, thus bringing one of the rollers to a position to engage one of the levers and swing the same. This, in turn, operates the rock shaft to swing the switch point in either direction desired. As soon as the foot-pressure is released, the action of the spring will instantly restore the actuating rod and its related parts to normal position.

### Fertilizer Distributer.

A simple fertilizer distributer of novel construction is protected by a patent recently granted to John Blue, of Laurinburg, N. C. A vertical longitudinal sectional view through the structure is shown in the accompanying cut. As illustrated, a screw casing 3 is employed, to which are attached side pieces 31, forming a hopper. A screw carrying shaft 22 has bearings at the front and rear ends of the casing, and is extended forwardly of the same. On the front end is adjustably mounted a pinion 54. The transverse shaft 30 is journaled



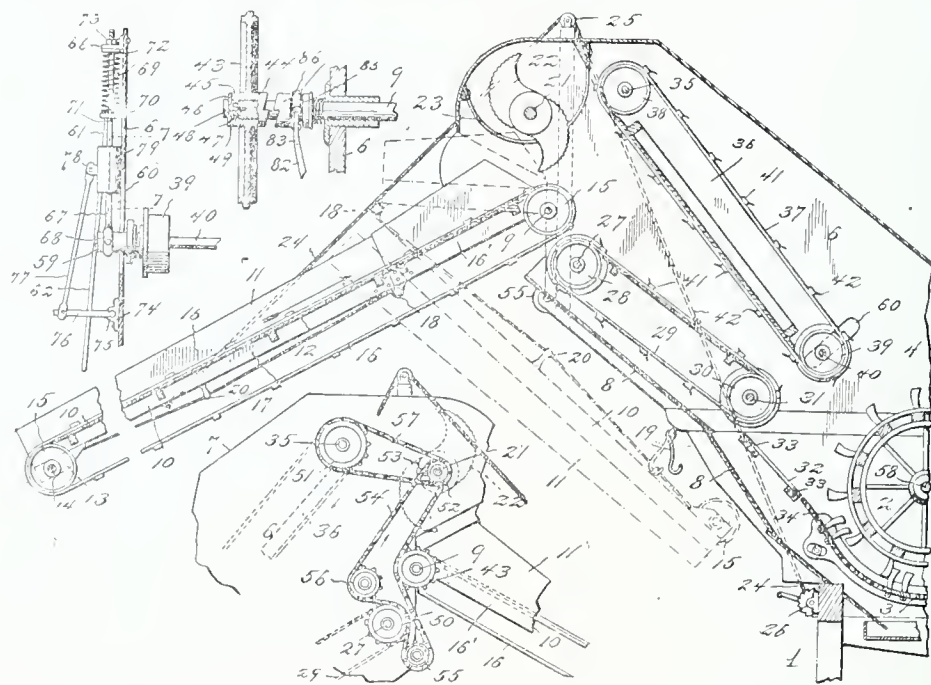
on the frame of the machine, and a traction wheel 31 is revolvably mounted thereon. This traction wheel has a central dished portion, and a plurality of concentric series of gear teeth formed at the bottom of the dished portion. The gear teeth are adapted to mesh with the adjustable pinion. The rear end of the screw casing is provided with a discharge opening, beneath which is disposed a downwardly adjustable distributor plate 26; and a screw 17, mounted on the shaft 22 and located in the casing, delivers the fertilizer to the opening. Suitable handles 11 are fastened to the frame, and covering shovels 14 are

also adjustably mounted on the rear end of the frame. It is preferred to make the feed-screw of frusto-conical or tapering shape and with threads of differential pitch, as shown—that is, the distance between the threads is increased with the increasing diameter of the body of the screw—this being an important feature, for the reason that the fertilizing material engaged thereby will thus be loosened and disintegrated as it is conveyed in the direction of the rear or discharge end.

By dishing the traction wheel, and locating the circumferential series of gear-teeth at the bottom of the dished portion, it is possible to bring the feed-screw-carrying shaft nearer the longitudinal center of the machine than would otherwise be convenient or possible, a single traction wheel being employed, as shown.

### Automatic Feeding Mechanism for Threshing Machines

Edgar P. Killinger, of Sevenmile Ford, Va., has secured a patent on a specific form of automatic feeding mechanism for threshing machines, his aim being to provide a superior structure which is very simple and durable, and in which the full capacity of the feed mechanism is not developed until the cylinder of the threshing machine has attained its full speed. This renders overfeeding impossible by the instantaneous and automatic throwing out of the gear of the feed mechanism, should the latter become clogged or choked. As shown in the accompanying illustrations, a feeder casing 4 is employed on which a sectional bundle carrier frame 11 is hinged by means of a drive shaft 9, around which passes a feeder belt 16, the shaft 9 constituting driving means therefor. On one end of this shaft is loosely mounted a sprocket wheel 43, that can be clutched to the shaft by means of the clutch members 44 and 86. The sprocket wheel 43 is driven by a sprocket chain, which constitutes a common driver for various other parts of the mechanism. A rotary band



guard 22 is located above the delivery end of the bundle carrier, and an auxiliary feeder frame is pivotally mounted in rear of the cutters. This frame inclines downwardly toward the threshing cylinder, and at its lower free end it carries a shaft 40, which projects through slots 60 in the sides of the casing. On one end of the shaft 40 is mounted yielding means 69 for flexibly and adjustably supporting the free end of the frame. A rock shaft 75 is supported upon the side of the feeder casing, and has a laterally extending arm 76 connected by a link 77 to a sleeve 79, that is associated with the yielding support. The other end of the rock shaft is provided with an arm that is connected to a clutch collar slidable upon, and rotatable with, the driving shaft 9.

## PATENTS, CAVEATS, TRADE-MARKS, COPYRIGHTS, AND DESIGNS. TWENTY-FIVE YEARS PRACTICE.

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## LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

### PELTON WATER-WHEEL CO. v. ABNER DOBLE CO.

(Circuit Court, N. D. California. November 20, 1905. 142 F. R. p. 520.)

#### PATENTS—INFRINGEMENT—WATER-WHEEL BUCKETS.

The Dodd patent, No. 454,638, for a water-wheel bucket, is for an improvement on the buckets of the prior art, and not of broad scope. It is not infringed by the bucket of the Doble patent, 633,184, which is also an improved form of bucket, but lacks essential elements of the Dodd invention.

### SILVER & CO. v. J. P. EUSTIS MFG. CO. et al.

(Circuit Court, D. Massachusetts. January 5, 1906. 142 F. R. p. 524.)

#### PATENTS—VALIDITY AND INFRINGEMENT—BATH-SEATS.

The Silver patent, No. 736,032, for a bath-seat, consisting of a wooden board, which is reversible, and having holes extending into the ends in which the arms of bent wire hangers are inserted and held solely by frictional contact, being removable and adjustable to adapt the seat to bath-tubs of different widths, while for a simple device, discloses invention, and was not anticipated nor invalidated by prior public use. Also held infringed by one structure made by defendants, but not by another.

### COMPTOGRAPH CO. v. UNIVERSAL ACCOUNTANT MACHINE CO. et al.

(Circuit Court, N. D. Illinois, E. D. January 19, 1906. 142 F. R. p. 539.)

#### 1. PATENTS—CONSTRUCTION OF CLAIMS.

If the wording of a claim of a patent is fairly capable of two constructions, one of which will sustain the claim and the other defeat it, that which will preserve the invention should be adopted.

#### 2. SAME—VALIDITY AND INFRINGEMENT—COMPTOGRAPH.

The Felt patent, No. 628,176, for an improvement in computing machines of the class having side by side printing action designed to enable such machines to print more than one vertical column of figures on a sheet of paper was not anticipated and discloses a novel and patentable combination. Also held valid as against the defenses of prior use and abandonment and infringed.

#### 3. SAME—PRIOR PUBLICATION.

A disclosure of an invention by publication is not sufficient to invalidate a patent therefor applied for more than two years thereafter, unless the description was so full and intelligible as to enable persons skilled in the art to which the invention relates to comprehend or make it without assistance from the patent.

#### 4. SAME—PRIOR USE.

An inventor of a computing machine completed a model which he took to the government Census Bureau where it was used by clerks for a week in order to test its efficiency in census record tabulation. At the end of such time the inventor offered to build other machines, and sell the same to the bureau, but the offer was not accepted. Several years later he applied for and obtained a patent for the machine without substantial change either in mode of operation or results. He testified that the use of the model in the census office was entirely for experimental purposes. Held, that under the circumstances such use did not amount to a placing of the machine on the market, but merely to an exhibition of the model, which did not invalidate the subsequent patent under Rev. St. § 4886 [U. S. Comp. St. 1901, p. 3382].

#### 5. SAME—ABANDONMENT.

Under the rule that on an issue of abandonment every reasonable doubt should be resolved in favor of the patent, a delay of eight years after an inventor had substantially completed his invention before he applied for a patent therefor will not be held an abandonment, which defeats the patent as against an infringer not shown to have sustained such injury by the delay as to give him an equitable right to insist on such defense.

#### 6. SAME—SUIT FOR INFRINGEMENT—PARTIES.

It is not necessary for the owner of a patent when suing for its infringement to join his sole licensee as a complainant.

### WESTINGHOUSE ELECTRIC & MFG. CO. v. ELECTRIC APPLIANCE CO.

(Circuit Court, N. D. Illinois, E. D. January 19, 1906. 142 F. R. p. 544.)

#### 1. PATENTS—VALIDITY—DOUBLE PATENTING.

Where an application for a basic patent is pending, the granting to the same inventor of a limited combination patent of which the subject matter of the basic patent is an essential element, is not an abandonment of the latter to the public.

#### 2. SAME.

The granting of a void patent for an improvement upon valid basic patents then pending on application cannot be held to impair the inventor's rights under the basic patents when granted.

#### 3. SAME—ELECTRIC MOTORS.

The Tesla patents, Nos. 511,559 and 511,560, relating to a method and means of transmitting electric power, are not for the same invention covered by patent No. 401,520, previously granted to the same inventor on a later application, and do not constitute a case of double patenting, nor are they affected by the expiration of the British patent corresponding to patent No. 401,520.

### WAY v. HYGIENIC FLEECE UNDERWEAR CO. et al.

(Circuit Court, E. D. Pennsylvania. January 5, 1906. 142 F. R. p. 552.)

#### PATENTS—INVENTION—CHEST PROTECTOR.

The Way patent, No. 593,954, claim 3, for a chest and neck protector, since the disclaimer of claims 1 and 2, is not so clearly void on its face as to justify its being so declared on demurrer.

### DIAMOND MATCH CO. v. SAGINAW MATCH CO.

(Circuit Court of Appeals. Sixth Circuit. January 20, 1906. 142 F. R. p. 727.)

#### TRADE-MARKS—COLORS—UNFAIR COMPETITION.

A manufacturer, without a patent, of tipped matches, in which it is essential that the head and tip should be of different colors to enable users to distinguish the tip on which the match should be struck, is not entitled to maintain a monopoly in the use of any two particular colors, merely because he used them first, and their use by another manufacturer without any simulation of packages calculated to deceive purchases as to the origin of the goods does not constitute unfair competition.

### INTERNATIONAL TIME RECORDING CO. v. DEY et al.

(Circuit Court of Appeals, Second Circuit. December 5, 1905. On rehearing December 22, 1905. 142 F. R. p. 736.)

#### PATENTS—VALIDITY AND INFRINGEMENT—WORKMEN'S TIME RECORDER.

The Cooper patent, No. 528,223, for a workman's time recorder, which prints the time of his going in and coming out each half day on his individual card, was not anticipated in the prior art and discloses invention, being an improvement over the machines in previous use in important respects. The combinations shown are not, strictly speaking, of old elements, having important new elements, especially in the card feature, which enables the workman to see and verify his entry, and in the card receiver having movable abutments operated automatically by a time mechanism, which renders it impossible to make an entry dating back to a half day which has passed; and the claims are not confined to the identical mechanism shown in the specification. Also held infringed.

### AMERICAN ACETYLENE BURNER CO. v. KIRCHBERGER et al.

(Circuit Court of Appeals, Second Circuit. May 17, 1905. On Rehearing Oct. 31, 1905. 142 F. R. p. 745.)

#### PATENTS—INVENTION—ACETYLENE GAS BURNERS.

The Shaffer patents, Nos. 617,942 and 634,838, for acetylene gas burners made entirely of refractory material, instead of metal with a refractory tip, do not show any novel mode of construction, but merely cover the substitution of one well-known material for another, and are void for lack of invention.

### CURTAIN SUPPLY CO. v. NORTH JERSEY ST. RY. CO.

(Circuit Court of Appeals, Third Circuit. January 22 1906. 142 F. R. p. 750.)

#### 1. PATENTS—INFRINGEMENT—SHADE HOLDING DEVICE.

The Forsyth patent, No. 559,446, for a shade-holding device for use chiefly on car windows, is limited by the prior art to the self-righting feature which is its essential element. As so construed, held not infringed by the device of the Hoyt patent, No. 676,557.

#### 2. SAME.

The Patterson patent, No. 659,315 for a shade fixture, construed, and held not infringed.

### SOCIETE FABRIQUES DE PRODUITS CHIMIQUES DE THANN ET DE MULHOUSE v. LUEDERS et al.

(Circuit Court of Appeals. Second Circuit. December 24, 1905. 142 F. R. p. 753.)

#### PATENTS—INFRINGEMENT—ARTIFICIAL MUSK.

The Baer patent, No. 451,847, for an artificial musk, in view of the disclaimer filed, limiting it to the product of the process of patent No. 416,770 to the same patentee, is not infringed by a product not shown to have been made by such process.

### AMERICAN ELECTRICAL NOVELTY & MFG. CO. v. STANLEY & PATTERSON, Inc.

(Circuit Court of Appeals, Second Circuit. December 21, 1905. 142 F. R. p. 754.)

#### PATENTS—INFRINGEMENT—ELECTRIC BATTERY.

Infringement of the Hogeon patent, No. 520,429, for an electric battery, by a battery in which the cells are not connected by the spring clamp specified in the patent, and which is an important, if not an essential feature of the invention, nor by any equivalent thereof, is too doubtful to warrant the granting of a preliminary injunction.

### MORRILL v. HARDWARE JOBBERS' PURCHASING CO. et al.

(Circuit court of Appeals, Second Circuit. December 6, 1905. 142 F. R. p. 756.)

#### 1. PATENTS—INFRINGEMENT—EVIDENCE TO ESTABLISH.

The offer by a defendant of an application for a patent, which shows a device infringing a prior patent with a statement that defendant is manufacturing thereunder, is insufficient to prove infringement of the prior patent, where such device is absent from the machine actually made by defendant, and introduced in evidence.

#### 2. SAME—SAW-SETS.

The Morrill patents, Nos. 441,962, 532,175, and 703,440, each covering a saw-set held not infringed as limited by the prior art.

### ALPHONS CUSTODIS CHIMNEY CONST. CO. v. H. R. HEINICKE, Inc.

(Circuit Court, S. D. New York. January 29, 1906. 142 F. R. p. 759.)

#### PATENTS—INVENTION—CHIMNEY.

The Custodis patent, No. 512,594, for a chimney composed of an outer wall having a number of inwardly projecting steps and of a sectional inner wall which is supported upon said steps, is void for anticipation, and also for lack of patentable invention in view of the prior art.

### WESTERN ELECTRIC COMPANY v. ROCHESTER TEL. CO. et al.

(Circuit Court, W. D. New York. December 29, 1905. 142 F. R. p. 766.)

#### 1. PATENTS—INFRINGEMENT—TELEPHONE SWITCHBOARDS.

The Scribner patent, No. 330,061, for a multiple telephone switchboard, was not anticipated, and discloses patentable invention; also held infringed as to claims 2, 4, and 6.

#### 2. SAME—NOVELTY.

The Scribner patent, No. 427,621, for improvements in telephone switchboards, is void for lack of patentable novelty in view of the prior art, being for a mere change of form producing no new result, and which was within the domain of the skilled workman.

### FITZGERALD MEAT TREE CO. v. NELSON MORRIS & CO.

(Circuit Court, N. D. Illinois, E. D. January 19, 1906. 142 F. R. p. 763.)

#### 1. PATENTS—INVENTION—ADAPTING DEVICE TO DIFFERENT USE.

A mere increase in the size, weight, or strength of a device so as to adapt it to an analogous use, although in a different art, is not invention.

#### 2. SAME—MEAT TREE.

The Oehmen patent, No. 688,674, for a meat tree is void for lack of patentable invention in view of prior devices used in display goods, practically the same in construction and mode of use.

### THAYER & CHANDLER et al. v. WOLD.

(Circuit Court, N. D. Illinois, E. D. January 19, 1906. 142 F. R. p. 776.)

#### 1. PATENTS—VALIDITY—OPERATIVENESS OF DEVICE.

It requires only slight evidence of successful operation to avoid the defense of inoperativeness of a patented device.

#### 2. SAME—INFRINGEMENT—AIR BRUSHES.

The Burdick patent, No. 474,158, and the Wold patent, No. 555,669, both for air brushes, held valid and infringed.

### PETERS v. CHICAGO BISCUIT CO. et al.

(Circuit Court, N. D. Illinois, E. D. Jan. 19, 1906. 142 F. R. p. 779.)

#### 1. PATENTS—SUIT FOR INFRINGEMENT—PERTINENCY OF ALLEGATIONS IN BILL.

In a bill to enjoin infringement of a patent, allegations setting out proceedings in other courts with reference to the patent, the granting of foreign patents thereon, and acquiescence therein in this and other countries, are proper, as going to the question of acquiescence; and are material, as tending to establish a presumptive right on an application for a preliminary injunction.

#### 2. SAME—DEMURRER FOR LACK OF INVENTION.

A demurrer to a bill for infringement on the ground of lack of invention will not be sustained, except in a clear case, and the decisions of courts in other jurisdictions are not so conclusive as to control on such demurrer.

#### 3. SAME—EQUITY JURISDICTION—ADEQUATE REMEDY AT LAW.

Allegations in a bill for infringement that complainant derives his benefit from his patent through limited granting of licenses does not deprive equity of jurisdiction by showing that he has an adequate remedy at law, where it does not appear that there is a fixed license fee for all users.

### WERCKMEISTER v. AMERICAN LITHOGRAPHIC COMPANY et al.

(Circuit Court, S. D. New York. December 16, 1905. 142 F. R. p. 827.)

#### 1. COPYRIGHTS—CONSTRUCTION OF STATUTE.

The intention of the copyright laws, as declared by the Constitution, being "to promote the progress of science and useful arts," they should be liberally construed to carry out such intention.

#### 2. SAME—PAINTING—COPYRIGHT BY "ASSIGN" OF AUTHOR.

Under Rev. St. § 4952, as amended by Act March 3, 1891, c. 565, 26 Stat. 1106 [U. S. Comp. St. 1901, p. 3406], which authorizes the copyrighting of a painting by the author or proprietor, or by the "assigns of any such person," the assignee of the copyright of a painting may obtain a statutory copyright upon it in the United States, although not the owner of the painting itself; the common-law copyright being capable of assignment separately from the painting, and such person being within the term "assigns," as used in the statute.

#### 3. SAME—NOTICE OF COPYRIGHT.

Act June 18, 1874, c. 301, 18 Stat. 78 [U. S. Comp. St. 1901, p. 3411], which requires notice of copyright to be given by inserting the same "in the several copies of every edition published, on the title page or on the page immediately following, if it be a book, or if a map, \* \* \* painting, \* \* \* statutory or model or design, \* \* \* by inscribing upon some visible portion thereof, or of the substance on which the same shall be mounted," \* \* \* does not require such notice to be inscribed upon the original painting or statutory copyrighted, but only on the "several copies" of the same; and a copyright of a painting is not invalidated by the fact that such notice is not inscribed on the original painting.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

James C. Thomas, Corsicana, Tex. Vehicle Steering Mechanism.—The construction disclosed in this patent, while capable of use in connection with general automobile constructions, was nevertheless particularly designed to facilitate the conversion of various classes of ordinary road vehicles into automobiles by equipping them with steering mechanisms well adapted for use in connection with a propelling motor. The construction, includes a steering shaft provided with a steering lever, a counter shaft geared to the steering shaft, a sprocket mounted on the counter shaft, and a chain passed around the sprocket and having its opposite ends connected to the vehicle axle at opposite sides of the axis from which the axle swings in making a turn.

Hiram D. Hackney, Sedgwick, Kan. Mail Carrying Cabinet.—The mail carrying cabinet of this patent, which is designed for use on a mail wagon, common buggy, or other vehicle, has suitable compartments for holding cash, stamps, postal cards, envelopes, money order and register letter blanks and the like, and is provided also with convenient means for holding the mail matter for distribution and the mail matter collected, and for enabling the former to be conveniently assorted, while driving from one point or box to another. It comprises a bottom, side and end walls, vertical partitions mounted on the bottom and having their upper edges in the same plane as the upper edges of the side walls, a box mounted upon the side walls and partitions, and having a hinged cover arranged to be supported by the said side walls and partitions to provide an additional compartment, and a plurality of drawers arranged between the vertical partitions. The cabinet, which may be suspended from the shoulder of a mail carrier by means of a strap, has a centrally arranged concave face at the back to fit the body of the person carrying it.

Stanislaus Wisniewski, Warsaw, N. D. Lock. Two patents.—It is the aim of the first patent to reduce to a minimum the liability of a padlock being surreptitiously opened, and it provides a padlock, which can be unlocked only by its particular key. The padlock comprises a casing having interior threads, a bolt provided with a reduced stem having exterior threads, adapted to be engaged by a key, which is provided with interior and exterior screw threads.

The second patent relates to a door lock, which can be opened only by its proper key. The lock embodies a casing having a key hole, a slidable bolt, a pivoted tumbler consisting of a body portion, and extending longitudinally of, and provided with means for engaging, the bolt, a resilient arm extending from one end of the body portion, and arranged at an angle to the same for holding the said body portion in engagement with the bolt, and a depending curved arm located at the other side of the bolt, and adapted to be engaged by the key. A flat plate located at the opposite side of the bolt, in a plane parallel with the same, is arched over the key hole, and lies in the path of the key. The lock is also provided with a catch, which is operated by a spindle, provided at one end with a threaded socket. The spindle is extensible by means of an adjustable section, which has opposite threaded stems. One of the stems is fitted in the socket of the spindle, and a nut engages the other stem.

Edward and Henry Turnell, Elm Creek, Nebraska. Hay Stacker.—The stacker devised by the Messrs. Turnell is a simple, durable and efficient implement for gathering either loose or bound hay from the field and depositing the same upon the stack. Mounted on the main frame of the machine, equipped with front and rear arches, is a swinging fork frame having a tiltable fork mounted at its front end. The fork frame and fork are elevated by a windlass operated by the movement of the carrying wheels of the frame. As the implement is moved over the field during the gathering of the hay, the windlass is inoperative; but as soon as a load has been accumulated on the fork, a clutch is operated by the driver to connect the windlass to the wheels. This fork elevating mechanism is very simple, but ingenious and effective. Another feature of the device comprises a pair of bars disposed parallel with the fork frame and connected at one end to the fork, and at their opposite ends to a crank shaft. These bars swing with the frame as the latter is elevated, and thus hold the fork in its proper horizontal position to prevent the slipping of the load during its elevation. When the fork has been elevated, the crank shaft which is located adjacent to the driver's seat is turned by the driver to move the bars longitudinally, and thus tilt the fork to dump the load.

Everett H. Mason, Clarksville, Tex. Buggy Top Support.—It is the object of the invention to provide a top support, adapted to be readily applied to a buggy or analogous vehicle, and capable of ready adjustment to accommodate itself to the distance between the pivots of the top and the brace or prop. The buggy top support effectively cushions the same on all kinds of roads, and embodies front and rear members slidably connected at their adjacent portions, and provided at their outer portions with eyes or openings to receive the pivots of the buggy top and the brace or prop, a longitudinal spring connected at its front end to the front portion of the rear member, and having its rear portion partially coiled and hung from the rear end of the rear member, and an oscillatory member mounted on the rear member and slidably connected with the buggy top and arranged to engage the spring at an intermediate point.

August Anderson, Nelson, Minn. Potato Digger.—The invention covered by this patent relates to improvements in potato diggers, and its aim is to lighten the draft, and thereby increase their efficiency and render them more easy of operation. The potato digger embodies a shovel or mold board, a beam provided at its rear end with a pair of transversely bowed depending arms or standards having their lower terminals arranged in the same transverse plane as their upper terminals, and extended beneath the shovel or mold board and secured to the rear end of the same at opposite sides thereof. The lower ends of the arms or standards are provided with lugs, and a shaker is hinged to the shovel by a pintle, which is mounted in the lugs of the arms or standards. Runners are also secured to the rear end of the shovel or mold board, and the shaker is vibrated by a wheel, which is connected with the runners by a link.

Charles B. Gilmore, Bloomington, Ill. Corn Popper.—The device is designed for use over the hole of an ordinary cooking stove, or in connection with any other heater, and is adapted also for use as a cooking utensil, where it is necessary or desirable to stir the contents of a receptacle continuously, or at intervals to prevent the same from scorching or burning. When used as a corn popper, it continuously agitates the corn and moves the unpopped corn to the center, where the heat is the great-

est, and will prevent the corn from scorching or burning, and thereby obviates the necessity of removing the contents until the corn has completely popped. Also, the device may be advantageously employed for stirring the seasonings, such as butter and salt, with the corn, and thoroughly mixing the same. Means are provided for enabling the operator to stand away from the fire or other form of heater, and at the same time operate the corn popper advantageously. The corn popper consists of a receptacle provided with a handle having an extended shank, curved stirring arms having imperforate outer portions and provided at their inner portions with openings or recesses, an exteriorly arranged crank connected with the stirring arms, and a removable handle having an elongated shank and provided with means for engaging the crank.

Harda P. Perkins, Poplar Bluff, Mo. Bottle Seal.—This invention provides means for preventing a bottle or analogous receptacle from being surreptitiously refilled and resold as an original package, and it is also impossible to adulterate the contents of a bottle after the latter has been filled and sealed. The neck of the receptacle is provided at its mouth with inwardly extending flanges, and the seal is provided with projecting lugs, arranged to engage the lower faces of the flanges and adapted to be carried beneath the same by rotating the seal. The seal is provided with a stop for limiting such rotary movement in one direction; and a locking device, which is carried by the seal, prevents the same from being moved backward.

Nels Peterson, Meckling, S. D., inventor; Carl Youngstrom, Allen, Neb., assignee. Gate Latch.—The latch is applied to that class of swinging gates, which are adapted to be raised and lowered to arrange them at different elevations, in order that they may swing clear of obstructions or afford a passage-way for small animals. The latch, which is adapted to engage the latch post at any point along the same, embodies upper and lower latch casings having aligned bearings, latch bolts slidable in the casings and provided with racks, pinions arranged within the casings and meshing with the racks, and a shaft connecting the pinions and adapted to be rotated for operating the latch bolts. The keeper, which is engaged by the bolts, consists of a T-shaped bar, which forms a continuous keeper of any desired length.

Carl Youngstrom, Allen, Neb., inventor; Erik B. Erikson, assignee, Meckling, S. D. Machine for Grinding and Polishing Cultivator Disks and Rolling Cutters. This machine, which is adapted to hold a disk against an emery, or other grinding wheel, in proper position for both polishing and sharpening the same, is automatically operated or actuated by the rotation of the grinding or polishing wheel. A disk is ground in full view of the operator, and the grinding operation is controlled by hand, so that when such operation is nearly completed, any parts or spots requiring additional grinding or polishing, may be readily led to, and held against, the grinding and polishing wheel. The machine comprises an adjustable support provided with bearings, an endwise movable shaft having bushings arranged in the bearings, a stub shaft mounted on the support and disposed at right angles to the said shaft, a wheel carried by the stub shaft, a gear mounted on the movable shaft, a pinion carried by the wheel and meshing with the gear, and a friction disk for engaging the wheel. A spring actuates the endwise movable shaft for holding the disk yieldably in engagement with the

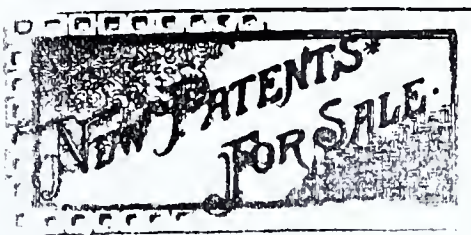
grinding device. The support is composed of a slidable member, a vertically swinging member hinged at one end to the slidable member, and an adjusting device for supporting the hinged member at the desired inclination.

Louise Reinhold, Santa Cruz, Calif. Envelop.—It is a well known fact that an expert, though unauthorized, person can very easily gain access to the interior of an ordinary envelop, and extract the contents thereof without leaving any trace showing that the envelop has been tampered with. The object of the present invention is to provide an envelop from which the contents cannot thus be extracted. Considered in its broadest aspect, the invention comprises an outer casing having an upper open mouth arranged to be closed by a gummed flap in the ordinary manner. Within this casing is formed an interior casing, or pocket having side walls, and a mouth that is located adjacent to the mouth of the outer casing. This inner mouth is arranged to be closed by oppositely foldable flaps that can be securely sealed. The entire structure is preferably formed from a single piece of paper, and the joints are so arranged that they cannot be readily opened.

William W. Mercer, inventor, Norfolk, Va.; B. J. Cady, Washington, D. C. assignee. Trolley.—The object of this invention is to provide a novel and comparatively simple trolley head, which will permit the wheel to assume different angular relations with respect to the pole, so that the danger of the trolley disengaging from the wire is very greatly lessened. In the preferred form of construction, the pole is provided at its upper end with a head having a vertical socket, in which is rotatably mounted a vertical spindle carrying a bracket. This bracket is provided with a journal pin on which the wheel revolves. The lower end of the spindle projects below the head, and has a transverse slot therein with a flat bottom, and a spring secured to the rear side of the head has an offset free terminal engaged in the slot and bearing against the flat bottom thereof. Thus, the wheel is permitted to turn on a vertical axis to conform to curvatures and the like in the wire, but it is always returned by the spring bearing in the slot.

Carl Youngstrom, Allen, Nebr. Calking Machine. It is a well known fact that recalking horse shoes is a tedious, undesirable operation, and that the results thereof, so far as appearances are concerned, are usually unsatisfactory. The primary object of the present invention is to provide novel means whereby the worn calks may be expeditiously removed, and new ones properly placed in position and secured. The machine consists of a base having spaced guide standards, with a ledger blade located at their lower ends. A reciprocatory plunger is slidably mounted between the standards, and has a cutter blade at its lower end that coacts with the ledger blade. A clamping block is pivoted upon the base at one side of the standard, and swings toward, and from, the ledger blade. A link is connected to the clamping block, and a lever fulcrumed upon the link has a pivotal connection with the plunger. On the opposite sides of the guide standards, is located an anvil or die block, and the lower end of the plunger carries a head that covers a recess formed in this die block. In using the machine, the calks are first cut from the shoe by the reciprocating plunger and co-acting blades, the shoe being held by the clamping block. The new calks are then fastened to the shoe and placed in the socket of the die block, after which the plunger is again operated to compress the same.





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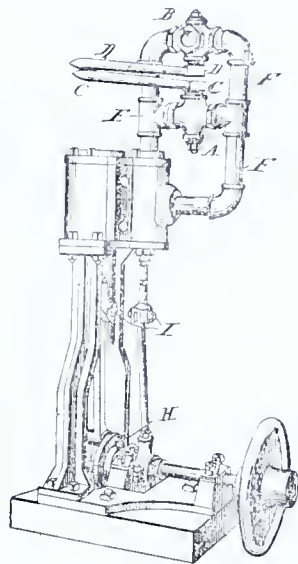
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## Railroad Signals.

The slow wheels of legislation are about to be set in motion in behalf of the safety of the traveling public. The enormous loss of life in railway accidents every year makes it imperative that measures be adopted to safeguard the conditions of travel. More than 50,000 persons were killed or injured in railway collisions last year, and the property loss mounted up to five million dollars. A large number of these casualties were due to the defective and antiquated signalling systems now in use. It is a matter for general congratulation that the interstate commerce commission is investigating this matter, with the intention of recommending to Congress new laws requiring block systems wherever needed.

There are 300,000 miles of railroad in the United States, less than 14 per cent of which is equipped with adequate signal service. Collisions destroy and maim more persons than any other class of railway accident, and next in number of victims rank derailments. All travelers are familiar with the signal towers that border railway lines, as well as with the semaphores—uprights from which jut out blade-like panels, set at different angles to operate the trains. In the manual system that is in vogue on a large percentage of our roads, the signalman communicates by a short code of electric bell signals with the towers on either side, announcing the passage of each train. At the same time, by means of long levers, he works the switches in his block and operates the semaphores. The levers are connected with the switches by means of long stretches of jointed gas pipe, moved upon rollers within long boxes. In a large railway terminal employing this system, half a dozen men are required to manually force these levers into position. It will be seen how clumsy and out-of-date such a method is. A much more nearly perfect means of train control is afforded by the automatic block system, in which the signals and switches are operated by electric currents flowing through the

rails of the section to be protected. To compare the working of the two systems, take a busy railroad with manual signal stations five miles apart and trains running 30 miles an hour. At this rate it would be impossible to operate more than six trains an hour over such a track. With the automatic system, on the other hand, with block sections half a mile apart, thirty trains an hour could pass over the same track, at a distance of a mile from each other. This only illustrates the traffic possibilities of a road worked with automatic signals, and does not deal with the much more important question of the greater safety gained through mechanical appliances. With the automatic block system installed, as well as interlocking safety devices and an automatic brake device such as is used on the subway express tracks in New York city, there would be a notable diminution in the death list of our railways.

## Paper from Cotton Stalks.

The manufacture of paper from the fiber of the cotton stalks is one of the most interesting inventions of the new century. It has been demonstrated that all the grades of paper, from the best form of linen to the lowest, can be made from cotton stalks. In addition to this, a variety of by-products, such as alcohol, nitrogen, material for gun cotton and smokeless powder, can also be secured in paying quantities. The time is not far distant when paper plants equipped with all modern machinery and devices for making paper and utilizing the by-products, will be built throughout the cotton growing states. The establishment of these mills will not only develop an industry of enormous proportions, and utilize a waste product, but will prove the entering wedge in checking the present increasing cost of paper, which is becoming such a burden to the newspaper industry of the country.

It is estimated that on an area of land producing a bale of cotton, at least one ton of stalks can be gathered. Upon the basis of calculation, the new industry can annually depend upon from 10,000,000 to 12,000,000 tons of raw material. This will not only furnish supplies for all home needs, but will permit the export of pulp or of finished products to foreign countries. The material mainly used for paper manufacture at present is spruce pine, which is annually becoming more expensive on account of the depletion of the forests and the high prices which this timber commands in the markets for other uses. The utilization of a waste product such as the cotton stalk, manufactured into commercial paper, will be a boon of inestimable value to the whole country.

The practical effect of the new invention will be to increase the value of the cotton crop nearly \$100,000,000 every year. The growers will be amply paid for the expense of removing the stalks from their fields and delivery to the paper plants, and in addition will receive a profit on their labor. In the southwest, the new industry will be a blessing, as the removal of the cotton stalks from the field in the early fall

will mean the death knell of the boll weevil, and its present devastating influences will be reduced to a minimum. From every standpoint, therefore, the speedy development and extension of this new industry will be welcomed.

## Exposition of Protective Devices.

The exposition of devices for safeguarding the lives and limbs of working men and women which is now open in Paris—reference to which has been made in several recent numbers of THE INVENTIVE AGE—is to have a successor in this country. The American Institute of Social Service will hold in New York city, next January, a similar exposition of inventions to prevent accidents under ordinary conditions of labor. This will attract the attention of inventors in many lines, as will be seen from the varied list of exhibits, noted below. The interest of manufacturers generally is solicited, as well as that of organizations whose special function is to improve the conditions of the laboring classes. Request for representation is made in the nature of models, photographs, descriptive drawings, and as far as possible, the devices themselves in actual operation. The groups of exhibits include the following: Section 1. Scaffolding, as well as the personal equipment of workers in building trades. 2. Protective devices for boilers, water gauges, signal apparatus, boiler and pipe valves; also protective devices for electrical machinery and acetylene apparatus. 3. Protective devices for motors and power transmitters, devices for turning on power and shutting it off, belt connection, couplings, etc. 4. Fire protection and the prevention of explosives. 5. First aid to the injured. 6. Mining and quarrying; devices in use on stone crushing machinery, etc. Storing of explosives. 7. Metal industry; safety devices for metal-working machinery. 8. Textile industry: safety devices for looms, carding, etc. 9. Leather and paper industry: safety devices for paper cutting, stamping and molding machinery. 10. Safety appliances for elevators and hoisting apparatus models. 11. Food products: safety appliances for kneading machines, rollers and cutters. 12. Personal equipment of workingmen: protective spectacles, respirators, suits, etc. 13. Workingmen's dwellings. 14. and 15. Housing: models, plans, photographs. 16. Ventilation. 17. Models, photographs and plans of toilet, dressing and living rooms, baths, etc. 18. Cooking: demonstration in heating food; models, plans, photographs. 19. Other social betterment institutions; reports of labor departments, industrial arbitration courts. 20. Agricultural machinery: safety appliances on same, demonstrated by models and views. 21. Lumber industry: safety devices for band and circular saws, planing machinery, etc., demonstrated by models. 22. Models, photographs and plans of workingmen's industrial betterment institutions of all kinds. Requests for information regarding space should be made to Dr. William H. Tolman, director, 287 Fourth Avenue, New York.

In this connection, it is interesting to observe that the French Industrial Association against accidents of labor has offered a prize of 8000 francs (about \$1500) for an international competition for a new galvanic battery or accumulator which, while having a large output for its size and weight, must not be dangerous in use. Inquiries for further details in this matter should be addressed to the director of the society, Rue de Lutèce, Paris. All descriptions and drawings in the competition must also be sent to this address.

## Trackless Trolleys.

Western engineers are investigating the traction by means of an overhead wire, and without the tracks, which always represent such a heavy part of the expense of installation. The system has been found to work well in certain countries of Europe. It is desirable to avoid the expense of providing each vehicle with a motor, and at the same time to have vehicles that will be free of tracks, and able to run in and out, as necessity requires, on country roads. Each omnibus is therefore provided with an upright pole, from which wires extend to the overhead wire. These are so attached and arranged that they work automatically, permitting the wagon to pass not only over the road, but in and out, so as to avoid all sorts of obstacles.

In practice, the current is received by the wheels of the overhead trolley and transmitted by a flexible cable which, as stated, is connected to the upright on the top of the car. The connection is effected by means of a movable sleeve. The tension of the cable is secured by the forward motion of the trolley, but in order to obtain greater elasticity, there is a loop of about 12 feet in the cable, which is elongated or shortened by means of a spring and counterweight, the latter working up and down the upright on the car. Direction is given to the car by means of a hand wheel steering apparatus, acting on the two front wheels of the car, which are pivoted.

The vehicles are said to make their way up hills of 8 per cent grade, turn easily in short circuits, and cover long distances in comparatively short periods of time, making 8 or 10 miles an hour. It is stated that the consumption of power is practically the same as on rails; but of course that is in a country like France, for instance, where the roads are hard, smooth and free from stones, and would not be true of America.

## Energy in Radium.

To compare the energy of various combustibles, a chunk of coal when burning releases enough energy to lift itself upward for 2,000 miles against the constant pull of sea-level gravitation. A chunk of hydrogen would lift itself about four times as high, but a piece of radium yields, without any combustion, enough energy to lift itself against sea-level gravitation not only to the sun, but to the orbit of the planet Neptune,—“the outside fence post of the solar system,” as it has been called, and which is many times farther from the sun than the earth is.



### Fluid Instead of Glass Lenses.

It is a common expedient for explorers in remote lands to create fire by the use of two watch crystals with water between them, which serve as a burning glass. This principle, it is said, has been adapted to the manufacture of optical lenses, with excellent results. Instead of grinding the lens at great expense out of solid glass, two convex pieces of thin glass, somewhat like watch crystals, are taken and hermetically sealed together, with an appropriate fluid between them. The new lenses, it is reported, are not only quite as good as the best massive glass lenses now used, but can be manufactured of a size three times as great as the largest homogeneous glass lens heretofore made.

Although the idea, as above noted, is not new, it is certainly a novelty in the line of optical goods, and has the further advantage of being very cheap. The price of a German ten-inch lens, for instance, is about \$1800, while a similar lens in the new style costs only about \$40. The largest glass lens manufactured out of massive glass for astronomical purposes, had a diameter of nearly five feet. It took several years to make it, and the price was upwards of \$80,000. Such a lens could be prepared by the new method in a few weeks, and at a cost of not more than six or seven hundred dollars. Lenses of less diameter for photographic purposes, for opera glasses, reading glasses, etc., can be manufactured at a price correspondingly low.

The glasses used for enclosing the fluid, we are told, are so selected in respect to refractive power and other characteristic properties that the surfaces not only serve to hold the fluid, but also combine with it to overcome such defects as are scarcely to be avoided in ordinary lenses. The fluid does not evaporate, as the lens is hermetically sealed, and its composition is such that its properties are not affected by time or by temperature. Another advantage, it is stated, is that on account of the fact that the fluid is not dense and the glass crystals are thin, the whole lens combination through which the light must penetrate is very slight. It is even claimed that the lens is achromatic, and though this is questionable, there is no doubt that the new process will serve to so cheapen lenses as to bring them within the reach of many who could not formerly afford to use them. The importance of the invention in the field of astronomy is obvious, and photography will also benefit. As the device is already on the market, we should soon expect to see large cameras offered at the present price of kodaks.

### Automobiles in Iceland.

The automobile has reached the frozen fastnesses of Iceland, and the motor boat is being used for the coasting fisheries. Some of these boats, it is said, are built in Iceland with imported motors, and some are brought entire from Denmark. Most of the boats are open, but some people buy them decked for deep-sea fisheries.

### Making Clothes by Machinery.

Among the contrivances that reduce the cost of making clothing is a machine for cutting cloth. Formerly, all the clothes worn by men were cut by hand, with shears. With the right sort of an instrument, a skillful cutter could cut five double thicknesses of cloth at once. As an improvement on this, knife cutting was devised. This was done with a long, thin, narrow-bladed and keen knife, much like a slender sword. It was used on a cutting table especially designed for it.

In this table there is a straight, narrow, metal-lined slot extending almost across the top. In use the knife plays in this slot. There are placed on the table layers of cloth of the required number of thicknesses, with the pattern marked on the top layer. The knife cutter does not draw the knife toward him, but thrusts it from him, with an up-and-down slicing movement of the blade through the cloth and into the slot on the table. Working the long, thin, sharp knife in this way with one hand, with the other the cutter manipulates the piled up mass of cloth, so as to bring the pattern line, to which he cuts, over the slot, and so works the knife forward along the line to the end. Good knife cutters can cut from 15 to 20 thicknesses of cloth at once. An expert can cut even 25. This was obviously a great advance over cutting with shears.

Then came into use the electric knife cutter, which is a little wonder. In outward appearance it somewhat resembles a moderate-sized gourd with a straight stem. The stem is the handle, and in the bulbous, gourd-shaped head is the little electric motor that operates the cutting knife up and down as a needle moves in a sewing machine, only far faster. Power is supplied by a flexible wire.

The use of the electric cutting machine calls for no particular exertion, only that it shall be gently and truly held to the pattern line. Thus held and guided, the machine fairly flies through the cloth. An electric knife will cut all at once 80 thicknesses of denim or duck, sixty thicknesses of overshirt flannel, 40 thicknesses of trousers' cloth, or 20 thicknesses of overcoat cloth.

There is a yet later clothes cutting machine that is likely to strike the layman as more marvelous still. It is known as a bandsaw machine. It operates not a bandsaw, but a band knife, and works in precisely the same manner as the familiar bandsaw of woodworking machinery.

Cloth intended to be cut by this device is laid down in long stretches, thickness on thickness, until the required number has been piled up. Meanwhile, on a long stretch of single thickness of cloth, on another table, a pattern marker is marking the patterns on the cloth. Then this single thickness of cloth, with the patterns thus marked on it, is laid on the pile of many thicknesses. A man with an electric knife cutter walks along this stretch of piled-up cloth, and cuts it into sections that can be handled on the cutting table of the bandsaw machine, where, following

the lines on the top layer, the cutter pushes this block, made up of layer on layer of cloth, up against the band knife, and so cuts all of the layers, in the shape of the pattern, at once.

The knife of a bandsaw machine is kept sharp by a stone attached to the machine for that purpose, so that it doesn't have to be taken out to be sharpened. It can be run until it is worn out and breaks, and each machine is run by its own independent electric motor. A bandsaw machine will cut sixty double thicknesses of heavy cloth at once.

In figuring on the cost of producing clothing, cutting that used to be calculated at 50 cents can be done on a bandsaw machine at a cost of a cent and a half.

### Artificial Silk.

Several varieties of artificial silk are being placed upon the market, at figures much below the genuine article. Cellulose forms the base for most of them. It was found that when cotton, wood pulp, or any other form of cellulose was treated to a solution of caustic soda, and the residue treated in turn with bisulphide of carbon and then with water, the whole would pass into solution. This viscose solution is forced through a tube which terminates in a number of infinitesimal holes, the end of the tube being at the same time immersed in a trough containing a solution capable of precipitating the cellulose. As the precipitation begins immediately on coming in contact with the precipitatory liquid, each film maintains its own integrity, and by the first operation, quite a number of minute filaments are twisted into a larger filament, adapted to weaving into a fabric. This was first used for electric lamp bulbs, and it was found that filaments could be made of all sizes, from threads as fine as a spider's web to cords as large as a lead pencil. From this to the manufacture of artificial silk was but a step, and it was discovered that the resulting fabric rivaled natural silk in beauty and durability.

Another variety is made from a base of hydrate of copper, the cellulose solution being stored in a reservoir, and emerging under pressure through capillary-orifices. The viscose spray is dissolved, and passes through a special chemical bath which coagulates the cellulose and converts it into a solid fiber while removing from it the copper and ammoniac.

But the best known of these artificial silks is made from gun cotton. It would startle many members of the gentler sex to realize that they were clothed in a material as explosive as dynamite; but as a matter of course it is treated so as to render it harmless. Alcohol is used in this preparation, and it is said that one of the first results of the new law permitting the manufacture of free alcohol for industrial purposes, will be the opening of a factory in this country to produce this silk, now imported from France. When the gun cotton is dissolved in alcohol it forms collodion, and this makes a solution of cellulose. This is injected into the preparation,

giving it brilliancy and tenacity. The alcohol is then evaporated from the filaments, and the silk is produced.

This new industry is believed to be capable of filling an important place in the field of modern enterprise. Chemists and scientists are endeavoring to perfect the methods, and it is thought that the textile will nearly, if not entirely, serve the purposes of the beautiful product of the cocoon.

### Infinitesimal Measurements.

An English college professor has succeeded, after five years' labor, in completing an apparatus by which it is possible to measure the one seventy-millionth part of an inch. The device that can accomplish such an unthinkable feat consists of a very fine micrometer screw and a series of six levers acting in conjunction with it. These are suspended by rubber bands from a specially made frame, and enclosed in a box. The general principle of the method is electric touch. The frame is placed in a vault and surrounded with every possible safeguard against friction and vibration, but even then, according to the professor, it is impossible to carry out successful experiments while there is traffic in the streets. Factories where motive power is employed also interfere with the operation of the device, unless they are at a considerable distance. Even a draft is said to be fatal to the successful measurement of such minute quantities as one seventy-millionth part of an inch. Dust must be kept from the vault, and it is asserted that even the buzzing of an ordinary fly has made it necessary to suspend experiments till the insect had been disposed of.

The apparatus, it is claimed, could be made especially serviceable in measuring engineering gauges. There are many uses for it—for instance, it will act as a most delicate coherer for wireless telegraphy, and will promote the study of nature and possibly of the movements of the molecules of matter. The professor is improving the apparatus in the hope of measuring quantities still more minute. Since nature deals in such small quantities, he is quoted as saying, it is useless to attempt to unravel her secrets without the finest instruments. It is believed that the present device surpasses every other form of measurement on gauges in delicacy and accuracy.

### New Lights for Railway Cars.

A novel method of lighting railway cars has just been tried in England. The inventor claimed that he could so utilize the electric battery as to be able to light the cars for a time long enough to enable them to cover 25,000 miles, without renewing or recharging. The dynamos were sealed up and the experiment was made. The cars covered the length prescribed—in other words, a distance exceeding the circumference of the earth—without any failure of light. The illuminant was as bright, in fact, on the last journey as on the first. The test operated for 12 weeks, with the train moving at varying speeds in either direction. It kept the battery of accumulators automatically charged. As an electrical engineer describes it, "it is an electric light station on a small scale, with an automatic instead of a human switch board attendant."



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Steam engine ..... J. A. Svenson  
Steam engine ..... W. Shepherd  
Steel and iron. Quenching bath for treating ..... J. Churchward  
Steel. Hardening and toughening ..... J. Churchward  
Steering device ..... F. A. Law  
Stenciling device ..... E. P. Rudolph  
Stoker. Mechanical ..... S. W. Simonds  
Stovepipe cleaner ..... E. Burger  
Strainer. Milk ..... A. M. Lorentz  
Street and station indicator ..... H. C. Wallace  
Superheater ..... W. Schmidt  
Surgeon's operating table ..... F. F. Lawrence  
Surgical implement ..... A. Littauer  
Switch control system. Multiple unit ..... F. H. Shepard  
Switch mechanisms. Automatic unlocking device for ..... J. D. Hillard, Jr.  
Switch tongue ..... P. L. Bailey  
Talking machines. Amplifying horn for ..... W. N. Dennison  
Tap Collapsing ..... E. M. Buckins  
Tapestry setting machine ..... F. A. Whitmore  
Telephone and other wires. Connector for ..... C. L. Pierce, Jr.  
Telephone circuit ..... M. W. Phillips  
Telephony. Reissue ..... H. O. Rugh  
Tennis rackets and similar articles. Holder or press for ..... W. Littlewhite  
Terpenes and rosin. Apparatus for extracting ..... G. A. Kerr  
Tie plate ..... A. C. Shand  
Tie plate ..... B. Wolhauser  
Time lock ..... H. C. Stockwell  
Tire. Vehicle wheel ..... A. T. Sherman  
Tires. Compound for sealing punctures in pneumatic ..... D. Charleston  
Tool ..... G. W. Onal et al  
Tool chest carrier attachment ..... W. E. Schreffler  
Tool. Combination ..... C. E. Roth  
Tool. Combination ..... C. Nielsen  
Tooth. Artificial ..... R. Brewster  
Top spinning pistol ..... J. W. Elbra  
Track laying machine ..... T. M. Garver  
Trolley ..... H. West  
Trolley ..... E. D. McDonald  
Trolley wheel and support ..... B. G. Young et al  
Trousers ..... B. Hirsh  
Truck bolster ..... C. A. Lindstrom  
Truck. Car ..... O. S. Pulliam  
Truck Motor ..... C. Schmidt  
Trunk ..... J. G. Huye  
Tube cutter ..... G. Wiedeke  
Turbine engine. Reversible rotary ..... J. F. MacIndoe et al  
Turn table ..... H. Bandmann  
Twist drill and socket ..... A. L. & A. H. Beardsley  
Type writer cushion key ..... G. W. Munson et al  
Type writing machine ..... E. E. Barney  
Type writing machines. Securing means for the hangers for ..... H. A. Moyer  
Vacuum pan ..... J. Kostalek  
Valve and adjustable cut off. Slide ..... W. Goodspeed  
Valve. Automatic exhaust relief ..... J. Acton  
Valve Flushing ..... J. H. Bell  
Valve for radiators. Air ..... H. M. Stevenson  
Valve. Relief ..... W. F. Krichbaum  
Valve. Water gate ..... 2 pats. .... A. J. Collar  
Vehicle hood frame ..... B. Cavallini  
Vehicle seat brace ..... I. W. Cool  
Vehicle shaft ..... D. W. Connell  
Vehicle storm front. Adjustable ..... G. W. Scott  
Vehicle top support and protector ..... A. S. Matthews et al  
Vehicle wheel ..... 2 pats. .... H. Bell  
Vehicles. Antivibration device for ..... O. W. Schum  
Vessel. Submarine ..... S. Wiebe  
Veterinary appliance ..... N. Stalder  
Voting machine ..... F. S. Thorneley  
Wagon seat ..... B. F. Lloyd  
Wardrobe ..... N. Ryan  
Washing machine ..... W. C. Foster et al  
Wastepipe. Urinal basin ..... J. MacDonald  
Watch barrel ..... S. R. Hoffmeister  
Watchmaker's tool ..... W. S. Richardson  
Water closer ..... J. C. Duner  
Water elevating and distributing system ..... A. D. Strong  
Water elevator. Siphon ..... J. N. Wood et al  
Water meter controlling device ..... L. H. Nash  
Water purifying and filtration system. Automatic ..... R. Law  
Water tube boiler ..... 2 pats. .... J. R. Brown et al  
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Web guiding device. Automatic ..... P. B. Klugh et al  
Well strainer. Oil and water ..... F. I. Getty  
Wells. Fishing tool for ..... I. H. Morrow  
Wheel ..... L. N. Wittum  
Wiggin place. Securing ..... W. Stelcher  
Wire. Automatic wiper for freshly galvanized ..... W. S. Myers  
Wire stretcher ..... H. C. Werner  
Woodworking tool ..... C. W. Justus  
Wrapping or packing small articles. Machine for ..... A. Anita  
Badger ..... H. W. Johnson, Jr., et al  
Badge ..... B. A. Richardson, Jr.  
Badge ..... J. R. Willcox  
Chair back ..... J. Silverman  
Clock case ..... E. Ehrle  
Eyeglass guard ..... G. Johnston  
Furnace ..... F. A. Magee  
Horn ..... 2 pats. .... C. Beecroft  
Paper. Box ..... T. Heiss  
Phonograph horn ..... P. B. T. Berner  
Prie dieu ..... J. E. Brielmaier  
Prie dieu. Confessional ..... J. E. Brielmaier  
Stool. Altar boy's ..... J. E. Brielmaier  
Corn sorter. Seed ..... L. P. Graham  
Coupling for surface rod lines ..... M. J. Starkey et al  
Cover actuating means ..... T. Rowe  
Cranberry picker ..... G. H. Chandler  
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Crimping device for starched laundry goods ..... W. Ormsby  
Cultivator ..... A. L. & R. J. Bsker  
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Cultivators. Replanter attachment for ..... O. Froman et al  
Curb and means for protecting curb angles. Gutter ..... J. W. Parker  
Curtain and shade bracket. Combination ..... B. Ostrem  
Curtain fixture. Automatic attaching ..... A. R. Snyder et al  
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Cutters in milling and cutting heads. Means of fixing ..... W. Wemhoener  
Cycle ..... E. Fothergill  
Cycle. Motor ..... W. H. Cress  
Cycle. Motor and other ..... W. J. Tooley  
Dam ..... W. L. Church  
Dampener. Stovepipe ..... A. Schwoil  
Dental bite taker ..... L. H. Crawford  
Dental crown construction ..... C. A. Skelstad  
Dental instrument for sitting and removing cap-crowns ..... L. Dollar  
Desk lid support ..... J. Herzog  
Digging or excavating apparatus ..... W. J. Newman  
Dish washing machine ..... W. M. Campbell  
Display rack ..... T. J. McElhenie  
Display stick ..... I. Gilsey  
Distilling apparatus ..... G. F. Wentz  
Distributor ..... H. E. Whipple et al  
Distributing box ..... H. H. Hornsby  
Door closure and check ..... W. K. Henry  
Door hanger ..... J. H. Burkholder  
Doubling and twisting machine ..... W. Gregory et al  
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Drilling machine ..... R. Wheeler  
Drum and cymbal heater ..... C. G. Conn  
Dust collecting or absorbing substance ..... B. Singer  
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Dye. Blue red azo ..... P. Tilius  
Egg heater and potato masher. Combination ..... M. E. Frank  
Electric furnace ..... L. Waldo  
Electric meter ..... T. Durcan  
Electric receptacle ..... B. E. Salisbury  
Electric switch with indicator. Double throw ..... E. M. Hewlett  
Electric transmission. Receiving device for ..... I. Kitsee  
Electrical circuits. Means for opening and closing ..... G. Pennerfelt  
Electrical conductor ..... A. G. Betts  
Electrical generator. Wave and current ..... J. T. Wilmore  
Elevator drive mechanism ..... S. R. Hart  
Embossing printed matter ..... J. E. Hudson  
Engine ..... C. E. Cleveland  
Engines. Rotary head for rotary ..... N. R. Smith et al  
Excavator and conveyer. Combined ..... A. G. Cameron  
Explosive mixer ..... H. Anchin  
Eyeglass fastener ..... D. W. Kotte  
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Eyeglasses. Lens mounting for ..... J. R. Van Tassel  
Fastening device ..... C. B. Longenecker  
Feeder and exerciser. Automatic poultry ..... H. A. Hannum  
Feeding mechanism ..... A. W. Howe  
Fence post ..... R. R. Rueto  
Fence. Wire ..... G. R. Wales  
File ..... A. L. Wells  
File cutting machine ..... J. A. Hess  
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Fire extinguishing powders. Receptacle for ..... C. H. Raymond  
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Fish culture tank ..... A. Ruckl  
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Floor, sidewalk, and like construction ..... P. H. Jackson  
Flour treating apparatus ..... R. L. Downton  
Fluid coupling. Automatic ..... C. H. Tomlinson  
Fluid pressure brake ..... R. Fitzgerald  
Flushing apparatus ..... J. Denton  
Folding machine ..... F. G. Nind  
Food chopper ..... J. H. Shaw  
Forced feed lubricator ..... H. Dicker  
Freezer and refrigerator car. Combined ..... O. M. Stimson  
Fruit clipper ..... D. H. Goode  
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Gage ..... H. Hansen  
Garment fitting device ..... R. A. Hampton  
Gas fixture and mirror support ..... L. Van Horn  
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Gas holder ..... W. Gadd  
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Gate ..... T. M. Courvey  
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Insulating composition and manufacturing the same. Electrical ..... C. Clement  
Intercommunication. Automatic system of ..... A. Van Wagenen  
Ironing board ..... A. N. Marsden  
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Journal box ..... J. S. Patten  
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Loading apparatus ..... S. B. Raw  
Lock ..... W. J. Carroll et al  
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Mandrel ..... B. Pangh  
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Multiple drill ..... W. W. Doolittle  
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Nail sorting machine ..... W. H. Johnson  
Name holder. Adjustable ..... H. Sampson  
Needle bath apparatus ..... S. J. Jackson  
Nest. Hen's ..... P. G. Townsend  
Numbering device ..... H. E. Fine  
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Oil burner ..... A. C. Butler  
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Ore concentrator ..... F. E. Pearson  
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Paint mixer and lead breaker ..... E. G. Appleton  
Paper cutting machine ..... F. Lipowsky  
Paper holder. Toilet ..... W. Pitschke  
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Pipe hanger ..... C. P. Maier  
Pipe hanger ..... M. G. Fwer  
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Pneumatic instruments. Pedal attachment for ..... C. H. Hubbell  
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Pumps. Automatic windmill pull out mechanism for ..... J. Stebbins  
Punch ..... W. S. Van Emon  
Punch. Knife blade leather ..... S. L. Alvord  
Punching and shearing machine ..... A. Adams  
Punching and shearing mechanism ..... I. G. Blum  
Rail Guard ..... W. H. Gnov  
Rail joint ..... D. P. Kelly  
Rail joint ..... F. M. Vaughn  
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Railway rail clamp ..... H. W. Case  
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Railwayswitch. Automatic safety ..... J. W. Hubbard  
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Rod connecting device ..... F. F. Helm  
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Run holder ..... E. H. Bailey  
Safety device ..... A. C. Parker  
Sand and gravel assorter and washer ..... P. P. Chmieleff  
Saw blade ..... A. F. Jones  
Saw edging machine. Gang ..... I. N. Hagne  
Saw frame. Hack ..... A. Adamblawitz  
Saw guides. Lead adjusting mechanism for ..... F. T. McDonough  
Scale guard and marker ..... I. R. Keller  
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Scrapping point ..... T. R. Porter  
Sealing device for parcels, &c ..... I. Hillmann  
Sealing means for vessels ..... T. A. Hiehe  
Seam ripping device ..... I. W. Ormsby  
Seasickness on ships, &c. Device for preventing ..... H. Rinne  
Seeder and planter ..... G. G. Gibbertson  
Setting die ..... W. S. Elliot  
Sewing machine. Hemstitch ..... C. M. Abercrombie  
Sewing machine ruffler ..... W. James  
Sharpening. Knife ..... A. J. Baries  
Shaving mow cover ..... S. J. Connies  
Sheet metal hollow ware drawing press ..... P. P. Hahnemann  
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Shuttle bobbin ..... E. M. Palmer  
Silicides and silicon alloys. Manufacture of ..... F. I. Tene  
Silo ..... D. D. Powell  
Skirt hanger ..... P. T. R. Novins  
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Sleeve protector ..... G. Rorer  
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Stone marking device. Artificial ..... S. S. Chezem  
Street indicator ..... A. Schimmel  
Sugar bowl ..... M. Escudery Castella  
Sulfite liquor and compound obtained. Treating waste ..... J. S. Robeson  
Sulky ..... C. H. Pajau  
Surgical appliance ..... F. W. Brown  
Switch ..... M. Holpfer  
Tag Shipping ..... M. A. Stewart  
Tank ..... I. Anderson  
Taper gage ..... F. Lulher  
Target throwing trap ..... E. D. Felford  
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Telegraphy ..... 2 pats. ..... I. Kinsee  
Telephone receiver ..... H. F. Albright  
Telephone switchboards. Spring jack for ..... H. B. Holmes et al  
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Telephone transmitter ..... S. A. Duvall  
Telephones. Lock out system for party line ..... 2 pats. ..... W. M. Bruce Jr  
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Thermal cut out and circuit changer ..... A. O. Stigberg  
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Threshing machines. Metal body for ..... W. A. Spencer  
Ticket box for theaters ..... P. H. Brehmer  
Tie and rail fastener. Metallic ..... L. H. Pfelehardt  
Tire shield. Pneumatic ..... I. H. Lowrey  
Tire wheel ..... L. H. Roome  
Tombstone or monument ..... A. H. Howard  
Tool. Hand ..... H. Geisenhoner  
Tool. Pneumatic ..... N. W. Fletcher  
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Transformer ..... J. I. Frank  
Transmission lines. Safety system for high tension ..... J. D. Hilliard, Jr  
Trolley ..... A. H. Dreier  
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Trolley wheel ..... G. Troxler, Jr  
Truck and weighing scale. Combined ..... A. C. Johnson  
Truck side frame. Car ..... E. Kaylor  
Tube cleaning apparatus ..... H. Van Ormer  
Tubing. Flexible joint for electric ..... W. F. Ward  
Turbine. Elastic fluid ..... 2 pats. ..... C. W. Dake  
Turbine. Self condensing ..... R. S. Prindle  
Turpentine box and spout ..... S. G. Lewis et al  
Twine holder and cutter ..... G. A. Olson  
Type writer carriage stop ..... J. Alexander  
Type writer construction ..... J. Alexander  
Type writer feeding mechanism ..... L. E. Wilkes  
Type writer platen shifting mechanism ..... J. Alexander  
Type writer paper feeding mechanism ..... J. Alexander  
Type writer ribbon operating mechanism ..... J. Alexander  
Type writing machine ..... A. W. Hewitt  
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Type writing machine ..... O. Woodward  
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Urn ..... R. F. Deane  
Valve ..... A. K. Butler  
Valve. Automatic pressure retaining ..... A. Ashcraft  
Valve. Blowing engine ..... G. Mesta  
Valve cleaner. Filling machine ..... F. C. H. Strachurger  
Valve gear ..... C. Hammen  
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Valve operating means for rotary engines ..... N. P. Smith et al  
Valve. Pressure regulator air ..... Z. C. Brewster  
Valve. Puppet ..... 2 pats. ..... T. Stebbins  
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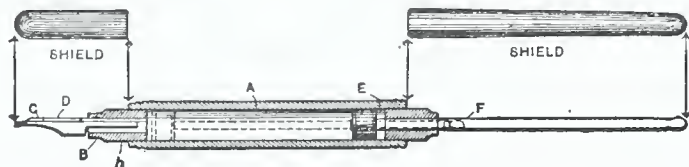


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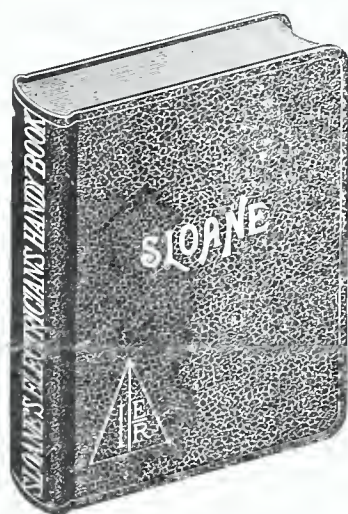
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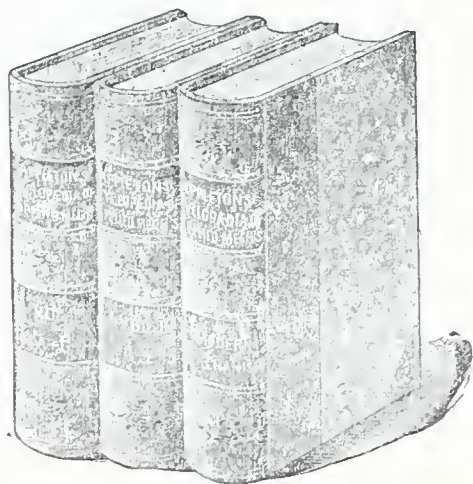
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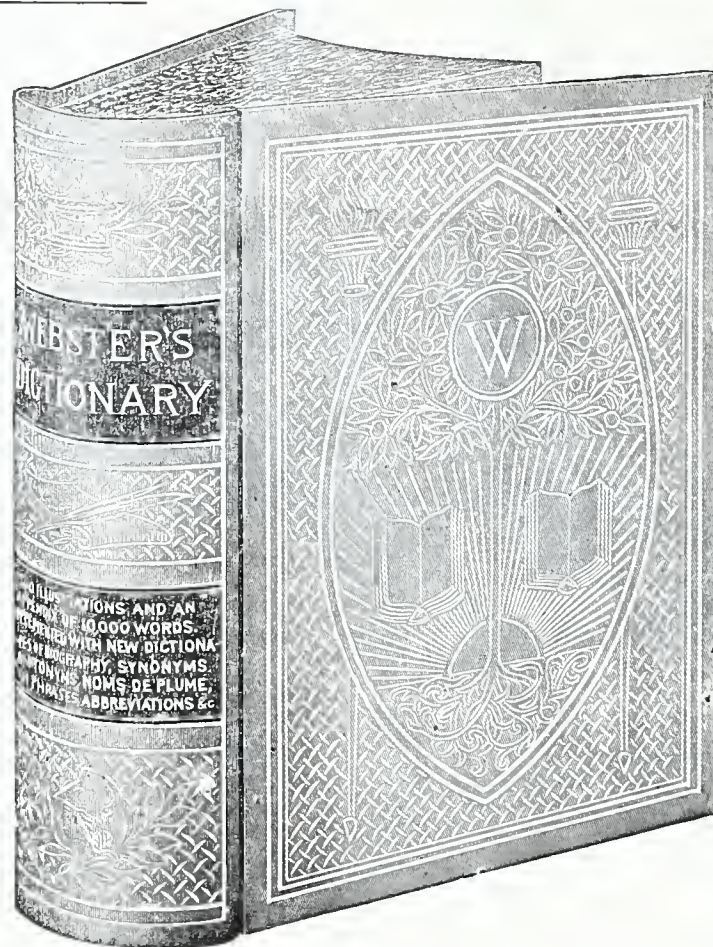
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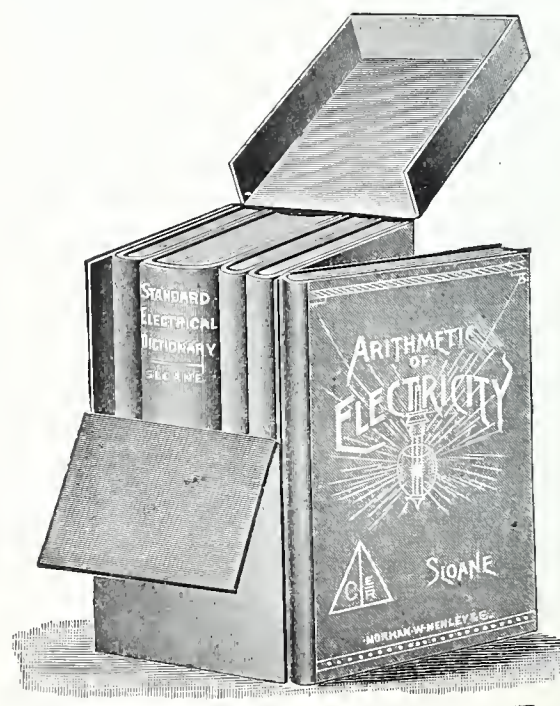
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EIGHTEENTH YEAR. }  
No. 12.

WASHINGTON, D. C.—DECEMBER, 1906.

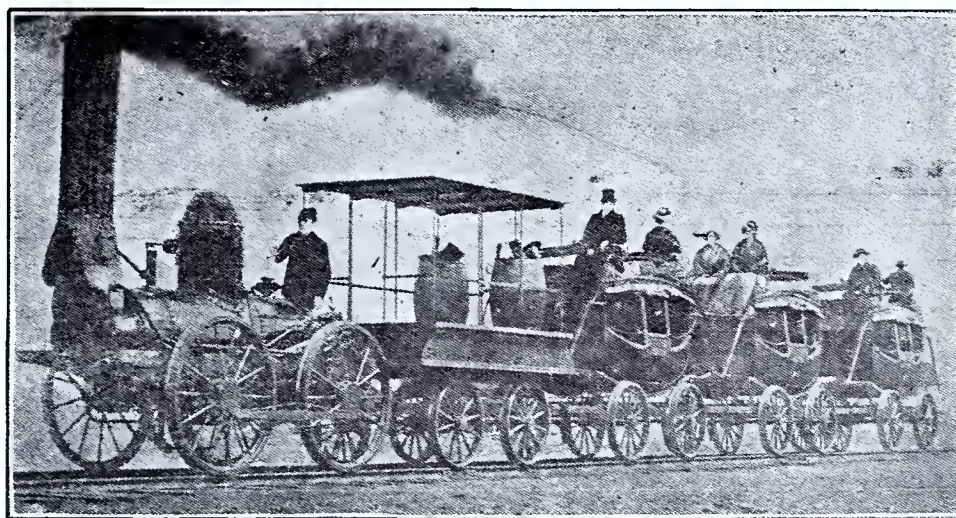
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## THE ADVANCE IN RAILROADING.

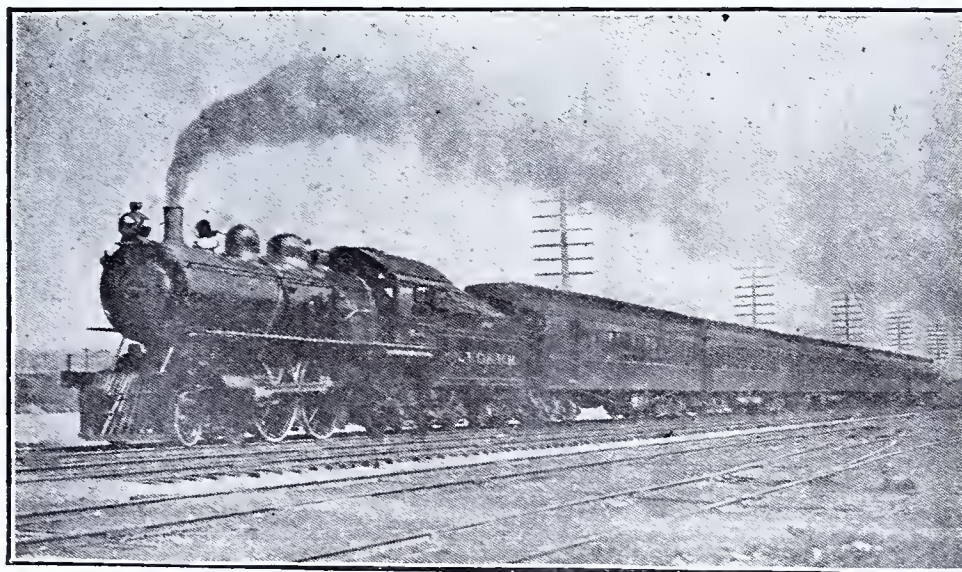
FROM the crude passenger train illustrated on this page to the luxury of motion embodied in the Empire State Express, is a long stride. More patents have been granted in the class of carriages and wagons than in any other field, which shows that methods of transportation have engaged the largest share of man's inventive genius. The father of the locomotive was an Englishman, Richard Trevithick, who first built a steam carriage in 1801. It was adapted to carry eight passengers; and an old lady, on seeing the frightful machine, declared that it was nothing but a walking, puffing devil. The first practical locomotive to run on a railroad in the United States, was imported from across the water; but our inventors soon commenced making them for themselves. The famous "John Bull," now in the National Museum at Washington, was built by Stephenson & Co., for the Camden and Amboy Railroad, and was brought from England and put into service in 1831. During the Chicago Exposition in 1893, it was taken out and made its way under its own steam to Chicago, drawing a train of two cars a distance of 912 miles without assistance.

George Stephenson, whose name is associated with the first successful achievements in locomotive construction, built an engine in 1812 with rough wheels and a cog track, the idea prevailing that smooth wheels could not draw a load over a smooth track. It remained, however, for Peter Cooper to build the first locomotive to draw a car in the United States. It was called Tom Thumb, and it ran over the Baltimore and Ohio tracks from Baltimore to Ellicott City, a distance of thirteen miles, in one hour and twelve minutes.

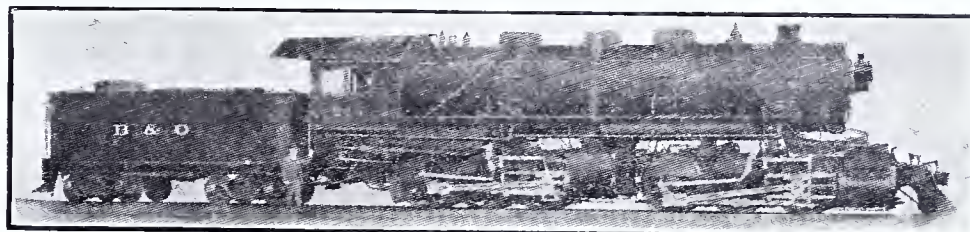
The Baldwin Locomotive Works, of Philadelphia, has a notable career in the field of locomotive construction. One of its early engines is shown in the illustration. It had four wheels and weighed a little over five tons. The drive wheels were 54 inches in diameter, and the cylinder 9 and one-half inches. The wheels had heavy cast iron hubs with wooden rims and spokes and wrought iron tires, and



ONE OF THE FIRST TRAINS OPERATED IN AMERICA.



EMPIRE STATE EXPRESS.



LARGEST LOCOMOTIVE IN THE WORLD.

the frame was of wood placed outside the wheels. The boiler was 30 inches in diameter and had 72 copper flues 7 feet long. The engine was fed from a couple of barrels placed on a truck behind the locomotive, and the passengers rode in ordinary horse coaches, the wheels of which had been adapted for this novel and perilous form of transport. A speed of 17 miles an hour was attained, and many persons predicted divine vengeance on such

unseemingly haste. It is a long stride from those days, when the time tables bore the inscription "The locomotive will leave the depot every day at 10 o'clock if the weather is fair" to the present, when the same works are turning out a thousand locomotives a year.

The eighties of the last century represent perhaps the greatest epoch of railroad building in the world's history. A million dollars a day was the estimated cash outlay on this account for the three years closing in 1882, and during this period over 28,000 miles of railroad were opened up in the United States, or more than enough to girdle the entire earth. The tubular boiler, the link motion, the injector and the air brake are successive steps in the development of the modern apparatus, while the more recent include the application of the principle of the compound expansion engine, in which two or more cylinders of different diameters are used, the steam at high pressure acting in the smaller cylinder and being then exhausted into, and acting expansively upon, the piston of the larger cylinder. The adoption of this principle is said to involve a saving in coal of over 25 per cent. Still another step is the use of superheated steam, as described in a recent number of the INVENTIVE AGE. The engine illustrated as drawing the Empire State Express has 55 tons on its driving wheels, and is of the four cylinder, balanced, compound type. It is among the most powerful passenger locomotives in the world, and can draw a heavy train at the rate of a hundred miles an hour.

A noticeable feature in connection with these passenger locomotives is that all have wide fire boxes. The power of the modern engine depends on its capacity to generate steam with great rapidity, which, in turn, depends on the ability to burn the greatest amount of coal economically in a given space of time. It is for this reason that the designers of modern engines are led to adopt the wide fire box, in order to increase the grate area and thereby generate steam rapidly.

But it is not only in the passenger



service that progress has been made. It is estimated that the railways of the United States carry every day, in merchandise, a weight equal to that of the whole of the seventy odd million constituting its population. The heaviest freight locomotive in the world has been built by the Baltimore and Ohio railroad, and a view of it is given herewith. It has a total weight of 239 tons, of which 167 tons rest on its twelve driving wheels. This locomotive was designed for heavy mountain service, where it is essential to utilize every pound of weight of engine as adhesive power. It will be seen in the cut that this engine has no trailing or front trucks, and while its wheel base is very long, it can inscribe itself on the shortest curve. This arrangement has been obtained by inserting a double hinge in the centre of the frame and allowing the front three pairs of driving wheels to displace laterally. In other words, there are two sets of driving wheels, and the rigid wheel base is only that of one set. An idea of the size of this locomotive can be obtained when it is remembered that ten years ago, at a date later than that of the Chicago Exposition, a locomotive weighing 50 tons was considered a powerful machine.

The Mammoth is really a pair of locomotives with one boiler, which is carried on two sets of driving wheels, each of which is 57 inches in diameter. When in working order, the locomotive weighs 193,000 pounds less than the combined weight of two of the heavy consolidation locomotives used for similar work. It has the greatest heating surface ever put into a locomotive—5,586 square feet, of which 219 feet are in the fire box and 5,367 in the tubes, which are 21 feet long. The immense power of the machine may be conceived in the draw bar pull of 74,000 pounds when working compound, and 84,000 when working simple. The weight of trains that

can be taken up the mountain by two of the consolidation locomotives is about 2,035 tons; combined with an ordinary engine, the giant can pull up the grade about 3,210, at a speed of 10 miles an hour. Although this is the first of its size in the world, and therefore in the nature of an experiment, a five months trial, during which it has covered 17,000 miles, has shown that it has worked most successfully.

One of the means for obtaining the greatest economy for the railway company in handling freight has been to increase its trains from the twenty to forty carloads to about 30 tons capacity of ten years ago, to the six to one hundred carloads of about 50 tons capacity of today. The economy obtained in heavier trains will be obvious from the fact that it requires the same number of men, or crew, to handle a small train as it does to handle a large one; and the routine work connected with the forwarding from one station to another is also the same. Furthermore, the large engine has proved more economical in its consumption of coal and water as compared with the small locomotive. An order for more of the same dimensions has been given.

## MACHINE FOR SAWING PULP WOOD.

LUMBERMEN and manufacturers of wood products are manifesting interest in a pulp wood sawing machine which originated in Canada, the seat of the greatest wood pulp industry. It is claimed that one man alone, operating the machine, can cut 5,000 logs every ten hours, and this without any undue exertion. The system of sawing, which is automatic, was invented by Mr. Elie Perron, and patents have been taken out for it in the United States as well as in Canada. In these days of scarce labor and high wages, the new machine promises to be a boon to pulp manufacturers. In one mill in Quebec, it is related, the company had installed an expensive sawing system, imported from Norway, which required the services of 18 or 20 men to operate. After a test with the Perron apparatus, it was at once substituted for the Norway plant, effecting great economy of time and labor.

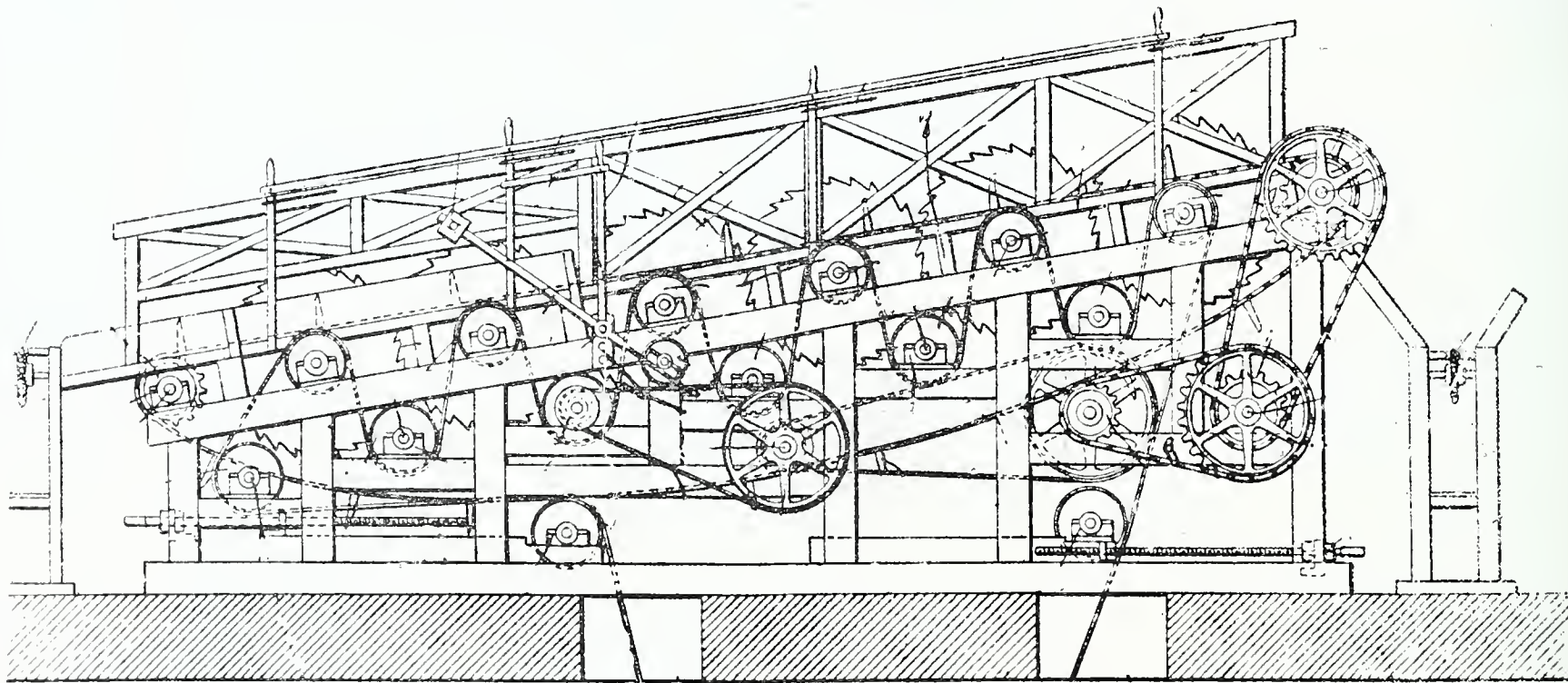
The machine, which is illustrated in the accompanying engraving, consists of a system of circular saws. An endless chain placed in a trough or con-

cal, as one belt runs the whole machine, and a single lever slows, accelerates or stops the saws. It is estimated that the cost of sawing 100 logs of 12 feet, with the old machine, was fifty cents; the new apparatus performs the same task at an expense of six cents. This is a remarkable instance of economy, and the apparatus is worthy the study of pulp makers, not only on account of its great saving in wages for labor, but also because of the large quantity of wood it cuts. The whole installation takes up very little room, and it is said, can be installed at reasonable expense.

Although everyone knows that the most important use for wood pulp is the making of paper, few understand the process, or realize that the paper they hold in their hands as they read this paragraph, for instance, is a pliable sheet of wood. It is the product of a ground-up or macerated tree, and if examined closely will show the fibers, like small splinters, all through the paper. Two methods of effecting the transformation are used, the mechanical and the chemical. The first

from the top. This forms sulphurous acid, which is drawn off into the digester filled with chips. Steam is turned on and the whole mass cooked until digested, when it is washed with water. The fiber is then formed into sheets, the water pressed out, and the pulp is bleached, and is then ready for use in the manufacture of pails, dishes, boxes, picture frames, matings, car wheels, steam and water pipes, telegraph poles, electric conduits, insulators, coffins, shoe heels, horse shoes, spools, tool handles, buttons, pulleys, paving blocks, surgeon's splints, astronomical observatory domes, and for hundreds of other objects.

More than a million and a half cords of wood are used every year in the production of sulphite pulp, and of this nearly four-fifths is spruce. With such a huge demand, there is a corresponding diminution in the supply of standing spruce, and a consequent increase in its cost. The demand for paper is so great—especially for the big newspapers, a Sunday edition of each of which consumes acres of trees—that the problem of supply is urgent. There has never been an era like the present for cheap printed matter. The grain upon the spruce forests is so heavy that although the



veyor brings the logs from without and deposits them on a large table, where a series of saws, placed at distances of two feet apart, revolve at a high rate of speed. Another endless chain system, supplied with claws, travels at right angles to the first and conveys the logs to the saws, which cut them into two-foot lengths. These fall into another trough, and are conducted by another endless chain direct to the pulp wood barker. The capacity of the machine is 500 logs of 12-foot lengths, cut into two-foot dimensions ready for the barker; and only one man is required to do the work. A single machine with its attendant, working at the rate of ten hours per day, can easily supply twenty grinders working twenty-four consecutive hours. In other words, the new machine does with one man one-third more work than the type of machine ordinarily employed accomplished with the aid of twenty men. Maintenance and repair are also economi-

cal. The process is a simple one, and consists merely of grinding the wood with water until it is reduced to a pulpy mass. The pulp mills are located near the forests, and generally on a good water power site. The product is not held to be as high grade as the chemical pulp, which has a longer and tougher fiber. The chemical processes are two: one uses caustic soda and the other sulphurous acid, to separate the useless matter from the fiber. The caustic soda process is used mainly for poplar. Spruce is the timber most commonly employed for pulp.

The plant of a typical sulphite pulp mill consists of a saw for cutting the logs into convenient lengths—as above described—a wood preparing room in which the bark is stripped off, and a chipper to reduce it to small pieces for the digester. The digester plant has a tower in which sulphur is burned at the base, and the fumes pass up through cooling pipes to meet water which percolates through limestone

lumber supply of Canada is seemingly exhaustless, and the United States has still huge areas of woodland, the day can be foreseen when some other wood will have to be substituted. Experiments are being made by the forestry service as to the pulp-making possibilities of other trees, and so far, balsam is the most promising. It is hoped, too, that an opportunity will be found of utilizing wood waste, sawdust, slabs and edgings for this purpose, thus saving the standing supply.

### Destroying Mosquitoes.

It is joyous news for those who have suffered from the perennial and persistent mosquito, to learn that an apparatus has been perfected for electrocuting it. It consists of a small lamp—electric or oil—hung between two rings, the latter being connected with tiny vertical and parallel chains. These chains are charged with a current of electricity; sufficiently strong to kill instantly a mosquito which touches them. The light attracts the insects, and as the lamp is surrounded by these chains, they rush to their death.



## THE JAMESTOWN EXPOSITION.

No section of the country is so hallowed by history-making events as that part of Virginia, on Hampton Roads, whose shores are lined with historic points of interest, where the Jamestown Exposition will be held in 1907. Foremost among these land-

is two hours run from Norfolk. Here are still to be seen remains of the old settlement of three centuries ago and a museum of old historic relics of the early days of America.

Craney Island, at the mouth of Elizabeth River, near Norfolk, is an-

ventions on the spot hallowed by so many historic memories, and those who had previously made arrangements to meet elsewhere will include a visit to the Exposition in their itinerary.

Among the organizations that will take this pleasant outing there is none that will excite more interest or receive a more hearty welcome than the Society of the Army of the Potomac.

This organization is made up of veterans who served in the Army of the Potomac during the Civil War, and their present purpose is that one of all most dear to the chivalrous heart of a soldier—to keep alive the memories of their campaigns.

During the spring of 1907, the Society of the Army of the Potomac will unveil a monument in Washington, D. C., to one of its ablest commanders, Gen. Geo. B. McClellan. As the occasion will evoke a full measure of the long cherished fondness and admiration for "little Mac" which his soldiers always retain, the ceremonies attending the unveiling will doubtless draw a full number.

But the old soldiers will not be content to limit their visit to the national Capital. A trip down the Potomac to the Jamestown Ter-Centennial Exposition will bring them near to the scenes of nearly half a century ago when youth and valor sustained them in hardy enterprise.

What an optimistic aspect the events of '61-5 now present to view. The cultured thought of the country is indiscriminate in bestowing praise on the men who wore the conflicting colors of those days. The Blue and the Gray are associated together on the record of renown, and the survivors of the contest have long since forgotten the embitterments. The cordial salutation and warm grasp of the hand is now the form of greeting, and these veterans who followed McClellan will be cheered by the remnant of those that followed Lee.

They are passing away rapidly these brave soldiers of nearly half a century ago. The Gray and the Blue of 1861-5 are swiftly becoming a memory, a reminiscence. No other such opportunity will ever recur as that which the Jamestown Exposition will give for these valiant old men to meet and fraternize, to talk over the drastic happenings at Fredericksburg and Manassas, and to congratulate each side the other that they have lived long enough to see real, genuine, irrefragable friendship reformed and re-established.

The Water Belt Line, touching at Norfolk, the Exposition Grounds, Fort Monroe, Old Point Comfort, Hampton, Newport News, Portsmouth, and Berkeley, will furnish ample facilities for the Jamestown Exposition visitors to sail completely around all the naval vessels assembled in Hampton Roads, and visit all the points of historic interest, in a trip so delightful that few, if any, will miss it. The rates of transportation, too, will be such that cost will cut little figure in planning such trips.



BIRD'S EYE VIEW OF JAMESTOWN EXPOSITION.

marks is Old Point Comfort, so named by the first settlers because of the safe anchorage, afforded by its protected shores, for their storm-tossed vessels. Here is also located Fort Monroe, the chief artillery station of the United States Government on the Atlantic Coast. With its grim old walls and winding moat, Fort Monroe is one of the most picturesque as well as formidable military posts in the country. Yorktown, where Cornwallis surrendered to the Continental Army, is only a two hours ride by either boat or train from the Exposition. Here can be seen the monument erected by the Government in honor of the great victory of the American forces. The first custom house ever erected in America is also located at Yorktown. Within a stone's throw of the Exposition site, can be seen the remains of the earthworks, thrown up by the Confederate Army in their defense against the union troops in the battle of Sewells Point. The scene of the famous battle between the Monitor and the Merrimac is also close by, the fight having taken place only a few hundred yards out in Hampton Roads, from the grounds of the Exposition.

Williamshurg, the second capital of Virginia, seat of the second oldest college in the United States, can easily be reached.

Richmond, the capital of the Southern Confederacy, and an important point in history, is only a few hours ride from the grounds.

Petersburg, where the closing battles of the Civil War were fought, is near by, and Appomattox, where General Lee surrendered, is about three hours distant.

Jamestown Island, where the first permanent settlement of English-speaking people was made in America,

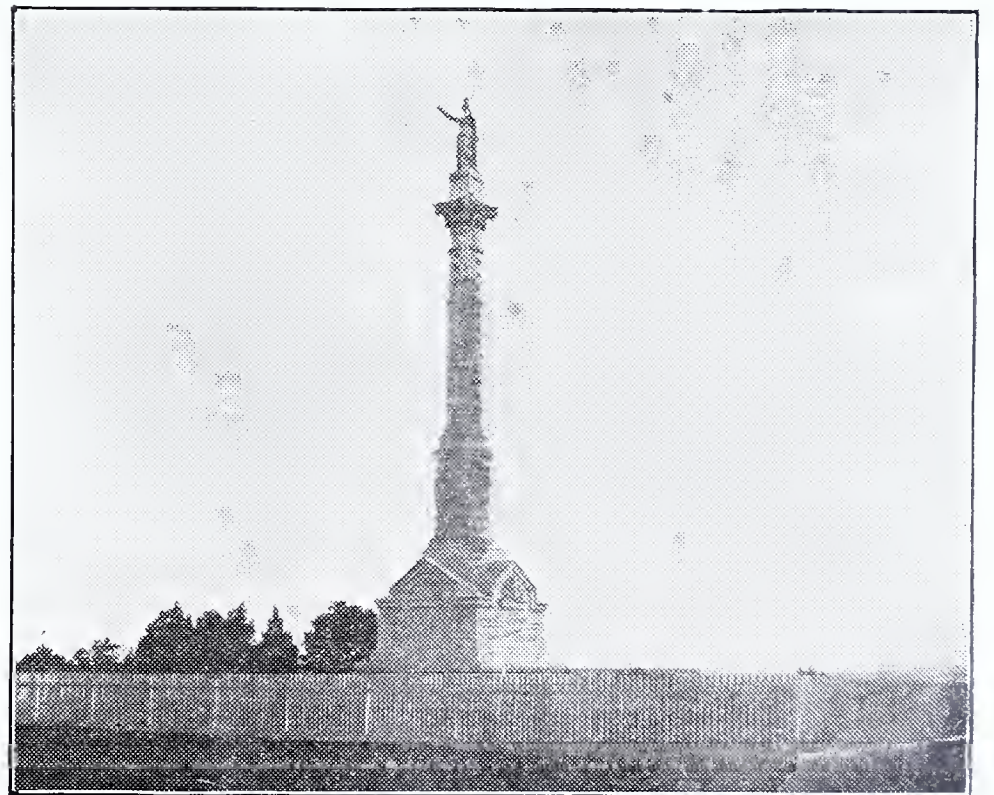
other point in American history.

Owing to the fact that the Jamestown Exposition will be the first celebration of its kind ever held in this country on deep water, there will be assembled in Hampton Roads, next year, the greatest naval pageant that the world has ever seen. These assembled navies of all of the representative nations, at anchor in the spacious harbor in front of the Exposition grounds, will include every type of fighting craft, from the smallest and most obsolete gun boat to the largest and most formidable man-of-war, affording a splendid opportunity for the comparison of the naval strength of the various countries that are to participate, and to note the progress in naval construction from the earliest stages.

The Exposition will be the mecca of visiting organizations that will embrace every diversification of our multifarious American life. These bodies which represent the energy, the industry, the associated worth of our country, will, for the most part, hold their annual reunions and con-



AUDITORIUM.



YORKTOWN MONUMENT SCENE OF SURRENDER OF CORNWALLIS TO WASHINGTON.

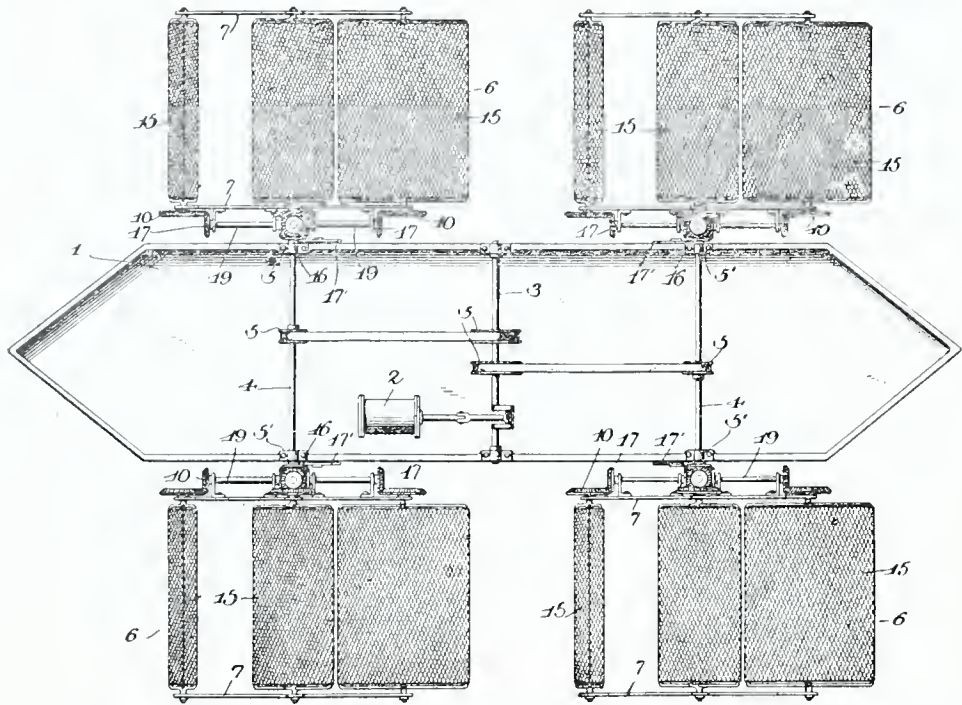


# CLEVER NEW PATENTS.

PROPELLER.—A NEW INVALID BED.—IMPROVED DRIVING GEAR.—NEW COFFEE OR TEA URN.—IMPROVED AUGER BIT.

## Propeller.

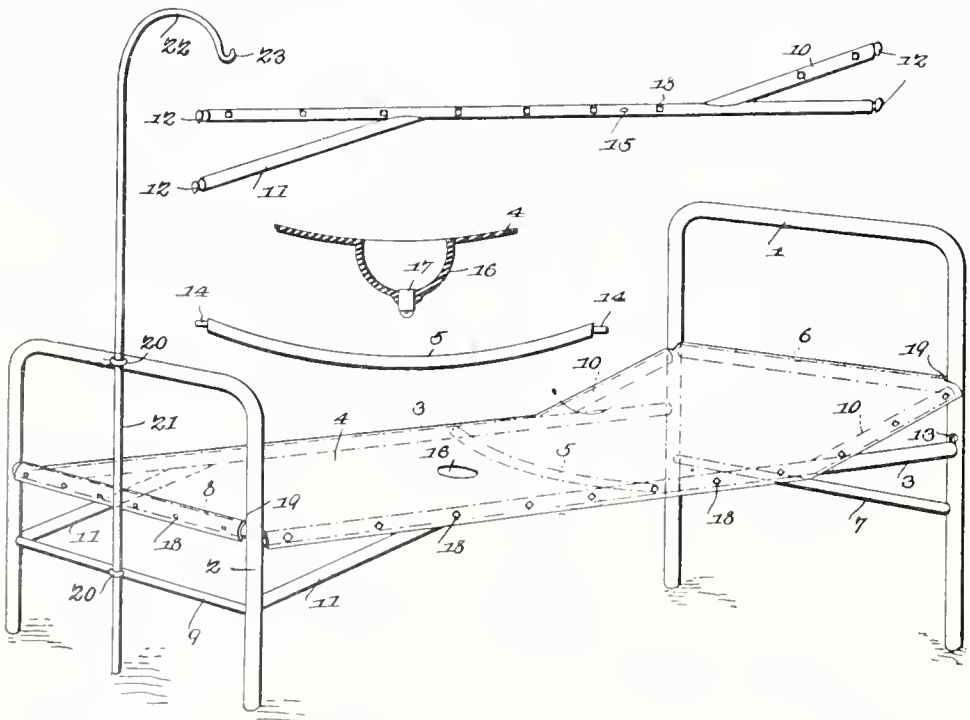
Charles J. Jones, of Topeka, Kans., has secured a patent on a propeller that is adapted for use in connection with vehicles of all types, including airships, boats, sleds, and the like. A top plan view of the structure is shown in the accompanying illustration. It will be noted that the motor 2 is located within a vehicle 1, and is connected by belts or gearing with shafts 4. On the outer ends of these shafts are mounted frames 7, in which are rotatably mounted blades 15. The blades 15 have gearing which is associated therewith, and with the shafts 4. This gearing is so constructed that when the motor 2 is in operation, and the propellers are rotating, the blades will also be revolved, so that they will present their full surfaces for action against the



air or other fluid during a single portion of their movement, and will feather during the remaining part of their travel. This feathering action can be made to take place at any point desired by adjusting the gearing, suitable means being employed for that purpose. The blades themselves are constructed so as to form a pocket when thrust directly against the air or other fluid, and during the remaining portion of the stroke are inactive and remain perfectly flat.

## A New Invalid Bed.

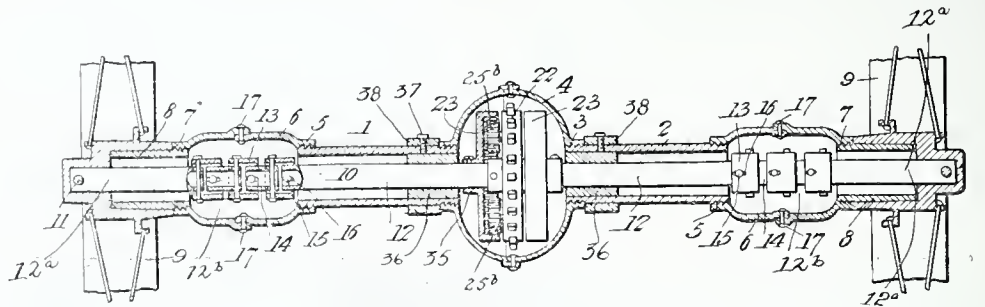
An invalid bed having a number of desirable features for administering douches or enemas, is the subject-matter of a patent recently granted to Mr. John W. Bess, of Brilliant, Ohio. As shown in the accompanying illustration, a frame is employed having braces 11 at its ends, the frame and braces being connected to the end pieces 1 and 2 by suitable interlocking devices 12. Across the frame is stretched a bottom 4. This bottom has one end resting upon the upwardly inclined braces 10 and thus constitutes a pillow. In the center of



the bottom is formed a well 16 having a bottom closure 17. A supporting standard 21 is mounted on one of the end pieces of the bed, and has an over-turned supporting hook 23 at its upper end, to support a bag or other receptacle containing the liquid or detergent employed in administering a douche or enema.

## Improved Driving Gear.

Driving gear for automobiles has presented great difficulties to manufacturers. One of the latest improvements in this class of mechanism is disclosed in a patent granted to Mr. Orlando Richards, of Bristol, Wisc. The object in view is to produce driving mechanism of comparatively simple construction,

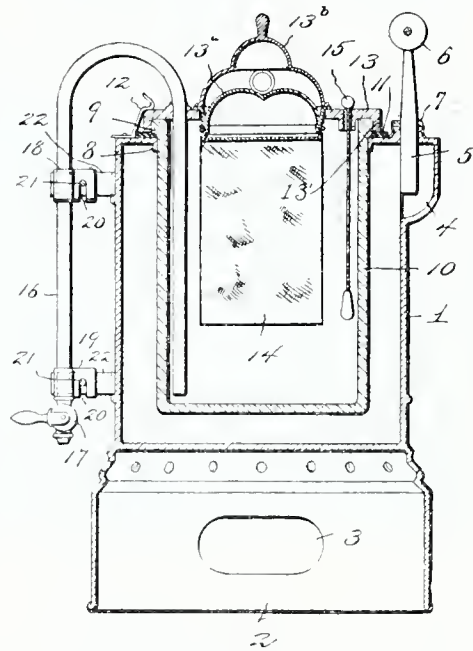


in which the wheel supporting axle and the drive shaft are provided with coincident pivoted or flexible sections at their outer ends, whereby the wheels may be readily turned to facilitate the guiding of the machine in rounding abrupt or sharp curves. It will be noted by reference to the accompanying sectional view, that a tubular axle is employed having internally threaded collars, and the tubular sections engage in these collars. End casing 6 are employed that comprise members pivoted together, as shown at 17. Tubular spindles 8 are fixed to the outer members, and the wheels 9 rotate thereon. A drive shaft 10 is disposed within the axle, and has its extremities fixed to the hubs of the wheels. This drive shaft is composed of two inner and two outer members, the inner and outer members being connected by universal joints 14, that are disposed within the end casings of the tubular axle. Internally toothed gear casings 23 are secured upon the inner shaft sections. A sprocket wheel 22 is journaled loosely between these casings, and gears 25 disposed within the casings, connect the latter with the sprocket wheel.

## New Coffee or Tea Urn.

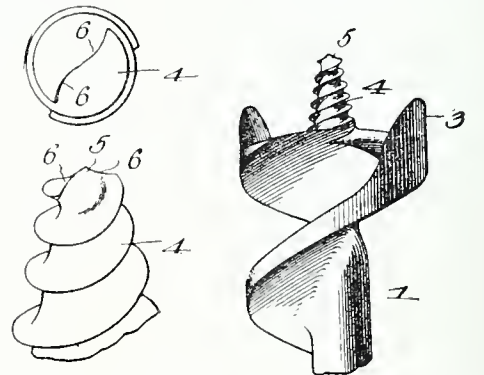
John B. Weis, of Toledo, Ohio, has secured a patent on a new type of coffee or tea urn. The body 1 of the urn may be of any desired construction, and has a base 2, within which the heater is placed. Depending within the upper portion of the body is a

level within the vessel 10. A siphon 6 has one leg depending into the vessel, while its other leg is provided with hooks 18-19 that detachably engage brackets 22 secured to the outside of the body 1. A suitable valve 13 controls the siphon. With this arrangement, the siphon can be readily removed without disturbing the remainder of the structure.



## Improved Auger Bit.

Charles Christopher Hiatt, of Wilmington, Ohio, has secured a patent on an improved auger bit, and more particularly the screw of the bit, his object being to so construct this screw that less power is necessary to enter it in the work, and to render it possible to keep the point sharp. The views illustrate the improved bit, and also illustrate in enlargement the novel point. It will be noted that the bit 1 is provided with a screw point 4 having a cone shaped core, and two flanges carried around it and constituting the cutting threads. The cutting ends of these flanges are



trimmed back on a curve from the point of the cone toward their outer cutting edges. By the provision of the peculiar shaped point of the screw, less resistance is presented to its entering into the wood, and, the point may readily be sharpened when it has become blunt.

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## LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

### TOLEDO COMPUTING SCALE CO. v. COMPUTING SCALE CO.

(Circuit Court of Appeals, Sixth Circuit.  
January 20, 1906. 142 F. R. p. 919.)

#### 1. COURTS—UNITED STATES COURTS—STATE LAWS AS RULES OF PROCEDURE—SER- VICE ON FOREIGN CORPORATIONS.

While service of subpoena from the federal court in equity upon a non-resident corporation is not controlled by state statute, yet, where there is no applicable provision of a federal statute, the procedure of the state statute, if deemed proper and reasonable, will be followed as, for instance, when the state statute declares what person shall represent the corporation in receiving service of process.

#### 2. CORPORATIONS—FOREIGN CORPORATIONS SERVICE OF PROCESS—MANAGING AGENT.

Under Rev. St. Ohio 1906, § 5043, which provides that "when the defendant is a foreign corporation, having a managing agent in this state, the service may be upon such agent," as construed by the Supreme Court of the state, the person who chiefly represents such a corporation as agent for the sale of its goods in a locality in the state, and who maintains an office or storeroom where such goods are kept, is a managing agent, within the meaning of the statute, although he is paid only by commissions on sales made within his district.

#### 3. EQUITY—JURISDICTION—MODE OF TAKING OBJECTION.

The objection that equity is without jurisdiction to grant an injunction, on the ground that there is an adequate remedy at law, should be taken in limine before answering to the merits, and, if not so taken, it will not be considered, where the remedy is at least suitable on the case made by the bill.

#### 4. EQUITY—MAXIMS—COMPLAINANT MUST HAVE CLEAN HANDS.

Complainant made and sold a "Butcher's Computing Scale" which it stated in its circulars to the trade would make a dealer a profit of 3 per cent, even if he sold at the same price per pound he paid. This was done by so constructing the computing mechanism that the price shown by the scale for the draft weighed was that for the next even numbered ounce above the actual weight. Held, that complainant had no standing in a court of equity to entitle it to a preliminary injunction to restrain a competitor from calling the attention of purchasers and the public to the fraudulent and dishonest character of such scale, where the proofs on the motion disclosed such facts.

### ENCYCLOPEDIA BRITANNICA CO. v. AMERICAN NEWSPAPER ASS'N. et al.

(Circuit Court of Appeals, Third Circuit.  
January 24, 1906. 142 F. R. p. 966)

#### COPYRIGHT—INTERIM COPYRIGHT ACT—CON- STRUCTION.

The Interim Copyright Act of January 7, 1904, c. 2, § 33 Stat. 4, which extended copyright protection for two years to exhibitors at the Louisiana Purchase Exposition, of foreign books, etc., which had not been copyrighted in the United States, on complying with its provisions, cannot be construed to apply to books of foreign authors which had previously been republished and sold in the United States without copyright; such books not being within the spirit of the act nor the intention of its makers.

### LINCOLN IRON WORKS et al. v. W. H. McWHIRTER CO.

(Circuit Court of Appeals, Second Circuit.  
December 5, 1905. 142 F. R. p. 967)

#### 1. PATENTS—VALIDITY—PRIOR INVENTION.

It is not enough to defeat a patent that some one other than the patentee had conceived the invention before he did, or had even perfected it, so long as it had not been in public use, or described in some patent or publication, if the patentee was an original and independent inventor.

#### 2. SAME.

A patent for a machine is not invalid because of the fact that the patentee obtained the general conception of the machine from another, but without disclosure of any means for carrying the same into effect, which means the patentee himself devised, and which constituted the only invention described and claimed in the patent.

#### 3. SAME—NOVELTY—STONE PLANING MA- CHINE.

The Gilmour patent No. 575,154, for a stone

planing machine having two tables which may be operated separately, or locked together and operated as one, as to claims 1, 2, and 3, is void for lack of patentable novelty; all of the parts of the machine being old singly and in combination, except the means for locking the two tables together, which were also known in the prior mechanical art and were merely applied by the patentee to a machine in which they had not before been used.

### KINNEAR MFG. CO. v. WILSON.

(Circuit Court of Appeals, Second Circuit.  
December 5, 1905. 142 F. R. p. 970.)

#### 1. PATENTS—ABANDONMENT OF INVENTION— DESCRIPTION IN ANOTHER PATENT.

The fact that an invention is described, but not claimed in a patent, does not operate as a disclaimer or abandonment of the same, where it is the subject-matter of a pending application by the inventor for another patent.

#### 2. SAME—ESTOPPEL—PRIOR REJECTION OF CLAIM.

Pending an application for a patent, and after notice of the rejection of one of the claims, the applicant filed an application for another patent, in which, by a subsequent amendment, he incorporated a claim substantially the same as the one rejected. After the allowance of the last application he formally canceled the rejected claim of the former application. Held, that there was no estoppel or abandonment by such cancellation or the prior rejection of the claim, which precluded him from asserting the validity of the claim as allowed.

#### 3. SAME—INFRINGEMENT.

The Kinnear patent No. 572,014, for a fire-proof blind, claim 3, was not anticipated, nor abandoned by the proceedings in the Patent Office on an application for another patent by the patentee and discloses invention, although entitled to only a narrow construction. Also held infringed by the structure of the Wilson patent, No. 682,304.

### AMERICAN STREET CAR ADVERTIS- ING CO. v. JONES et al.

(Circuit Court of Appeals, Second Circuit.  
May 24, 1905. 142 F. R. p. 974.)

#### PATENTS—LICENSES—REVOCATION—ROYAL- TIES.

A patentee of certain street car advertising racks wrote defendants a letter demanding payment of \$3 a car for alleged infringement in the building of such racks in certain cars, with an offer to make arrangements at the same rate for cars to be subsequently built. Defendants paid such rate for cars in question, and in answer to a letter from the patentee they sent a check for other cars at the rate of \$2 per car. The patentee accepted the same in payment for cars at the rate of \$3 and stated that he could not make the rate less, and that it was not to his interest to have the racks built into the cars. Shortly thereafter he wrote another letter, demanding a statement of all cars built with such racks therein, and notified defendant to discontinue building such racks, except at the rate of \$5 per car, to which letter defendants did not reply. Held, that the letters prior to the last did not amount to an irrevocable license for the life of the patent, and hence defendant, after receiving the letter of revocation, was relieved from further liability to account for or pay royalties.

### AMERICAN CHOCOLATE MACHINERY CO. v. HELMSTETTER.

(Circuit Court of Appeals, Second Circuit.  
August 1, 1905. 142 F. R. p. 978.)

#### 1. PATENTS—INFRINGEMENT—COMBINATION.

To constitute a combination it is essential that there should be some joint operation performed by its elements producing a result due to their joint and co-operating action, while in an aggregation there is a mere adding together of separate contributions each operating independently of the other. Hence a patent for a combination of elements in a machine is not infringed by a machine in which the elements of the combination are merely aggregated operating successively and independently of each other.

#### 2. SAME—CHOCOLATE DIPPING MACHINE.

The Holmes patent, No. 492,205, for a machine for coating confectionery, claim 1 covering "the combination with the drop dipping mechanism, of a jarring device for removing surplus coating material from the drops" is not infringed by the machine of the Weeks' patent, No. 634,633, in which the dipping and jarring devices are merely aggregated; the jarring operation being performed after the dipping has been completed, and the tray containing the drops removed to another frame.

#### 3. SAME.

The Gousset patent, No. 526,968, for a

chocolate dipper, claim 4 held infringed.

#### 4. SAME.

In the Walter patent, No. 533,974, for a chocolate dipping or coating machine, claim 1, the only novel element of the combination described and claimed, is the reversible mounting of the dipping tray, and the patent is not infringed by a machine which does not contain such feature.

### GALENA SIGNAL OIL CO. v. W. P. FULLER & CO.

(Circuit Court, N. D. California. January 12,  
1906. 142 F. R. p. 1002.)

#### 1. TRADE-MARKS—PURPOSE.

It is the primary purpose of a trade-mark to indicate the producer of the article or commodity on which it is used, and to distinguish it from like articles produced by others.

#### 2. SAME—DISTINCTIVENESS OF DEVICE— STAR.

A representation of a star cannot by its own meaning indicate the origin or ownership of such an article as lubricating oil, nor in view of its general use as a symbol can it be appropriated as a trade-mark except in connection with other devices or words such as to render the whole characteristic.

#### 3. SAME—INFRINGEMENT.

A trade-mark for a lubricating oil, consisting of the representation of a five-pointed star, with the word "Galena" above and the word "Oil" below it, and the letter "G" in its center, is not infringed by a device consisting of a six-pointed star made by imposing one triangle upon another and having the words "Extra Star" in connection.

### COLUMBIA WIRE CO. v. KOKOMO STEEL & WIRE CO.

(Circuit Court of Appeals, Seventh Circuit.  
Oct. 3, 1905. 143 F. R. p. 116.)

#### 1. PATENTS—INFRINGEMENT—IMPROVEMENT PATENT.

The patentee of an invention which, although for an improvement only, is of undoubted utility and constitutes a marked advance in the art, is entitled to protection, not only against colorable changes, but also to the benefit of the doctrine of equivalents commensurate with the invention disclosed.

#### 2. SAME—CHANGE IN FORM OR ARRANGE- MENT OF PARTS.

A patentee is entitled to protection against evasions of the wording of a claim in form or nonessential details, where the substance of the invention, which is unmistakably disclosed in the claims and specification, has been appropriated.

#### 3. SAME—INTERCHANGEABILITY OF PARTS.

Interchangeability of parts in two machines is not a conclusive test of infringement, where in the alleged infringing machine the parts have merely been rearranged by transferring their different functions, while the principle of operation remains the same, and the recombination as a whole is the equivalent of that of the patent.

#### 4. SAME—PROTECTION AGAINST IMPROVER.

The exclusive privilege of a patentee is to be protected to the full extent of his invention and grant, equally against an improver and the general public.

#### 5. SAME—WIRE-BARBING MACHINE.

The Bates patent No. 365,723, for a wire-barring machine, in which three butterfly wheels are used in combination in delivering the wire from the barbing mechanism to the twisting and spooling mechanism, discloses patentable invention; also held infringed by the machine of the Friedrich patent, No. 711,303.

### MAHONY v. MALCOM.

(Circuit Court of Appeals, Seventh Circuit.  
January 2, 1906. 143 F. R. p. 124.)

#### PATENTS—INVENTION—EYE SHADES.

The Mahony patent, No. 729,500 for an eye shade consisting of two pieces of thin light flexible material, such as celluloid, one crescent shaped and the other a straight strip, pivotally attached together at the ends so as to lie flat when not in use, and to form a visor and a band for the back of the head, respectively, when in use, while for a simple device, was not anticipated, and discloses invention. Also held infringed.

### HASKELL GOLF BALL CO. v. PERFECT GOLF BALL CO.

(Circuit Court, S. D. New York. February  
3, 1906. 143 F. R. p. 128.)

#### PATENTS—INFRINGEMENT—GOLF BALLS.

In the Work & Haskell patent, No. 622,834, for a golf ball comprising a core composed wholly or in part of rubber thread

wound under tension and an inclosing shell of gutta-percha, the word "thread" is not limited to a compound cord made by twisting together two or more strands, but includes any strip of rubber of whatever shape, and the patent is infringed by a ball made as described therein with a core made by winding a rubber band under tension.

### DOVER et al. v. GREENWOOD et al.

(Circuit Court, D. Rhode Island. January  
30, 1906. 143 F. R. p. 135.)

#### 1. PATENTS—RIGHT TO OBTAIN BY BILL IN EQUITY—CONSTRUCTION OF STATUTE.

Act Feb. 9, 1893, c. 74, § 9, 27 Stat. 436 [U. S. Comp. St. 1901, p. 439], creating a Court of Appeals for the District of Columbia, which vests in such court jurisdiction of appeals from the decisions of the Commissioner of Patents theretofore vested in the Supreme Court of the District, and also gives a right of appeal to such a court in interference cases, does not by implication repeal Rev. St. § 4915 [U. S. Comp. St. 1901, p. 3392], giving an applicant for a patent whose application is refused a right to obtain a patent by a bill in equity.

#### 2. SAME—RES ADJUDICATA.

The decision of the Court of Appeals of the District of Columbia on an appeal from the Commissioner of Patents, taken under Act Feb. 9, 1893, c. 74, 27 Stat. 436 [U. S. Comp. St. 1901, p. 3391] does not constitute an adjudication which precludes the maintenance of a suit in equity by one of the parties against the other to obtain a patent, under Rev. St. § 4915 [U. S. Comp. St. 1901, p. 3392].

### HILDRETH v. DUFF et al.

(Circuit Court, W. D. Pennsylvania. Feb. 1,  
1906. 143 F. R. p. 138.)

#### 1. SPECIFIC PERFORMANCE—CONTRACTS EN- FORCEABLE—CERTAINTY.

A contract reciting that one party, a candy manufacturer, was desirous of having perfected and manufactured "a certain machine or machines for use in the manufacture of candy," and by which the second agreed to enter his employment and to devote his services to such work, giving the first party the full benefit and enjoyment of any and all inventions and improvements he might make relating to machines or devices pertaining to the first party's business, does not so clearly import an agreement by the employee to assign a patent for an invention made by him relating to candy making, but differing essentially from any machine then known or used by the first party, as to warrant a court in decreeing its specific performance as so construed.

#### 2. CONTRACTS—CONSTRUCTION—AGREEMENT WITH RESPECT TO FUTURE INVENTIONS.

An agreement by an employee to give his employer, who was a candy manufacturer, "the full benefit and enjoyment" of any and all inventions which he might make pertaining to the employer's business, imports an agreement for a shop right or license to use such inventions merely, and does not entitle the employer to an assignment of patents secured by the employee therefor.

### DOWAGIAC MFG. CO. v. LOCHREN et al.

(Circuit Court of Appeals, Eighth Circuit.  
January 31, 1906. 143 F. R. p. 211.)

#### 1. EVIDENCE—PRODUCTION—COURT OF AN- OTHER DISTRICT SHOULD COMPEL, WHETHER MATERIAL OR IMMATERIAL.

It is not the duty of an auxiliary court or judge, within whose jurisdiction testimony is being taken in a suit pending in the court of another district, to consider or determine the competency, materiality, or relevancy of the evidence which one of the parties seeks to elicit.

It is the duty of such a court or judge to compel the production of the evidence, although the judge deems it incompetent, irrelevant or immaterial, unless the witness or the evidence is privileged, or it clearly and affirmatively appears that the evidence sought cannot possibly be competent, material, or relevant, and that it would be an abuse of the process of the court to compel its production.

#### 2. SAME—THIS RULE PREVAILS ALIKE IN SUITS IN EQUITY AND IN ACTIONS AT LAW.

The rule of practice above stated prevails in the taking of testimony before a commissioner or examiner, under rules 67 and 68 in equity, in the taking of testimony before a master empowered to determine the admissibility of evidence under rules 74, 77, 78, 79, and 82 in equity, and in the taking of evidence in actions at law under sections 863, 868, and 869, Rev. St. [U. S. Comp. St. 1901, pp. 661, 664, 665.]



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Hiram R. Lamb, inventor, London, Ontario, Canada: The H. R. Lamb Fence Company, assignee, same place. Wire Fence Structure.—The object in view in this invention is to provide means for tying the intersecting wires of a fence or analogous structure, this means being extremely simple and having a comparatively large number of points bearing against the crossed wires and preventing their relative sliding movement. The tie wire is in the form of a ring or loop that extends about the crossed wires, and engages opposite faces of the same on opposite sides of the crossing point. One of the terminal portions of the tie is disposed in substantial alignment with one of the wires, and its end bears directly against the same.

Joachim F. W. Kuehn, inventor, San Antonio, Texas; Fritz Steiner, assignee, same place. Match box.—This invention relates to match holding devices, which will deliver a predetermined number at a time. A box is employed within which is located a vertical sliding partition, separating the interior of the box into a front match holding compartment and a rear alarm-containing compartment. A reciprocating slide is mounted in the lower portion of the box and operates beneath the partition, being provided with a socket that will hold one match. Secured to the partition is a bell having a portion disposed in the path of movement of a projection on the slide. With this arrangement, every operation of the slide delivers a match and at the same time rings an alarm. The different sides of the box are provided with suitable panels arranged to receive advertising matter.

Neal A. McPhail, inventor, Cass City, Mich.; O. K. James, assignee, same place. Two patents.—One of these patents covers a gate hinge, the other a latch. In the former, an upper hinge is employed consisting of a plate that is bolted to the gate post and is provided with an upstanding pintle. A leaf member, adapted to be secured to the top of the gate, has a slot in which the pintle is received, and in this slot is journaled a roller that bears against the rear side of the pintle. The lower hinge consists of a plate secured to the lower portion of the gate post, and having a circular and downwardly inclined track, the lower portion of which is connected to the plate by a web, carrying an upstanding pintle. A leaf secured to the lower end of the gate, has a slot that receives this pintle, and a roller journaled in the slot, bears against the front side of the pintle. The leaf, furthermore, has depending spaced lugs in which is placed another roller that rides on an inclined track. With this structure, the gate will close itself; for when opened, it will be raised by the inclined track, and gravity will return it. The friction of the bearings is reduced to a minimum by the rollers employed.

The latch covered by the second patent is a simple, but effective device. A plate, secured to the gate post, is provided with an upwardly curved track, on which a pin carried by the free edge of the gate, is adapted to ride. A pair of holding dogs are pivoted to the outer sides of the plate and rest upon the track, so that the pin, when the gate swings to closed position, will move to a position between, and be held by, the dogs. These dogs are provided with overlapping tongues arranged above the track, and engaged by the offset lower end

of a vertically slidable plate. The upper end of this plate is curved to form a finger hook. Therefore, to release the gate, it is only necessary to raise the hook, whereupon the dogs will be elevated and the pin released so that the gate may be swung.

Paul Opocensky, Cuba, Kans. Combination Tool.—The tool comprises a shank or stock having an overhanging curved hook at one end, the free terminal of the hook being bifurcated to form jaws. A fulcrum device is detachably mounted on the shank or stock, and comprises a stem arranged longitudinally of the same. Means are employed for securing the stem against longitudinal and lateral movement on the shank, and an offset bearing constitutes a part of the stem, and projects longitudinally in the direction of the hook. The implement thus produced is adapted to be employed in stretching wire, in which case the wire is engaged between the jaws, and the fulcrum device is placed against the post. A powerful strain may thus be imparted to the wire for stretching the same. If nails are to be drawn, they are engaged between the claws, and the fulcrum device may be either left in place or removed. The end of the shank or stock opposite the hook produces an effective crow bar for prying off boards, and the like; and when so used, the hook constitutes a stop which will prevent the hands of the operator being injured when the boards suddenly give way.

Jacob A. Thomas, Hanover, Pa. Dental Disk Package and Holder. Two patents.—The dental disk package, covered by the first patent, is adapted to be employed as an original package for the sale of dental disks, and it holds the same until they are used. The dental disk package is adapted to receive a series of disks in a horizontal position to permit the use of a cover for protecting them from dust and dirt, and it enables the disks to be supported in an upright position to afford free access to the same, so that they may be readily removed as required. The disks are also prevented from warping or getting out of shape, while in the package. The device embodies a receptacle provided with a disk support, and a disk receiving rod or stem, hinged to the support and adapted to be arranged in substantially a horizontal position within the receptacle, and capable of being swung upward to an upright position to permit the disks to rest upon the support.

The second patent relates to a dental disk holder, adapted to keep the disks together and at the same time hold each size and grit separate, and capable of enabling the disks to be conveniently removed from it. The disk holder comprises a casing provided with one or more disk-receiving chambers, and having its top open at one side to expose approximately one half of the top disks, and to provide an opening through which a plurality of disks may be introduced for filling the holder. The casing is provided at the opposite side with a projecting cap for engaging the other half of the top disks, and a spring-actuated follower is located within the casing for clamping the disks against the cap. The casing is also provided at an intermediate point of its length with finger openings, arranged diametrically opposite each other, and of a size to permit either the disks or the follower to be firmly grasped for withdrawing the follower, thereby relieving the pressure on the top disk, so as to permit the removal of a disk without injuring its abrading surface.

Frank J. Pavlik, Armstrong, Nebr. Hay Stacker.—This stacker comprises a main frame, a swinging fork frame having a fork at one end, and a derrick mounted on the main frame and oper-

ated by cables to elevate the fork after the latter has been loaded. One important feature of the invention is the provision of an adjustable fork guard, the inclination of which with respect to the fork is adjusted by the manipulation of a crank operated drum located at the rear end of the stacker and operating through the medium of intermediate cables to effect the required adjustment of the guard. Another feature greatly adding to the efficiency of the stacker is the mounting of barbs on the tines of the fork, these barbs acting to prevent the slipping of the load from the fork, as for instance, when the stacker is being operated on a hillside.

Franz Wenke, Fort Reno, Okla. Stamp.—This invention relates to mail marking and similar hand stamps, and one of the principal objects is to provide means, which will permit the printing portion to assume different angular relations with respect to the handle so that the impression of the stamp will be properly made without regard to the angular position of the handle with respect to the surface marked. Another object is to eliminate the shock or jar incident to the impact of the stamp upon the surface. A casing is employed, within which is slidably mounted a type holder, the type being normally held within the casing by a spring, but being projected therefrom when the stamp is applied to the article to be marked. A handle has a stem slidably mounted in the opposite end of the casing, and has a head that bears against the inner face thereof. This stem can swing from side to side, but is normally positioned in a central location by springs, one of which is located within the casing, the other being disposed exteriorly of the same. The casing is made of sections, so that it can be readily taken apart when it is desired to change the type.

Ira E. Vanauken, Twin Falls, Idaho. Combination Tool.—The combination tool of this patent provides for house painters, decorators and the like, a putty knife and pot hook for suspending a paint bucket, or similar receptacle, from a rung of a ladder. The tool is provided with a handle, having a curved portion or hook at one end and a comparatively wide flat blade at its opposite end, the blade and hook being located in co-incident planes to permit the hook to engage the hand of the operator to prevent turning of the blade. A hook is formed conjointly by the handle and an extension of the blade. The curved portion or hook of the handle and the extension of the blade co-operate to form a pot hook, the handle engages the rung of a ladder, and the extension of the blade receives the bail of the paint bucket.

Max T. Christopher, New York, N. Y. Brick Cleaning Machine.—It is the aim of the present invention to provide a machine capable of cleaning or removing mortar, or other surface coating from bricks, and adapted to discharge the latter in a condition for use. The machine is also adapted to enable the operator to first clean the ends of a brick before placing the same in it. The machine, which first cleans the side faces and then the side edges of the brick, embodies rotary cleaning devices, arranged in sets and located at different distances apart for operating on the faces and edges of the bricks, and an endless carrier consisting of spaced chains and connecting devices. Yieldable brick-engaging devices are provided for holding the bricks on the carrier, while they are being operated on by the rotary cleaning devices.

Ellis J. Stanley, Table, Ill. Gate.—The object of the present invention is to provide for farms, stock yards and analogous places, a tilting gate, adapted to be opened and closed, at a

distance from either side of it, by a person on horse back or in a vehicle; and having an automatically operable counter-balancing weight for assisting the opening and closing movements of the gate, so that the same may be operated with a minimum effort. The weight, which is shiftable, is pivotally mounted on the gate to move independently thereof, and it is held against such independent movement by a catch. The operating mechanism for opening and closing the gate is provided with means for actuating a combined trip and keeper to disengage the catch from the weight.

William Handler, Jerseyville, Ill. Non Refillable Bottle.—The non-refillable bottle covered by this patent effectually prevents a liquid from being introduced into it, after it has received its original contents, so that fraudulent refillings and surreptitious adulterations are impossible. The device embodies a valve casing having a passage for the liquid and provided at opposite sides thereof with notches, which are engaged by a coiled spring for holding the valve in its seat, when the parts are in an upright position. The spring is interlocked with the valve casing by means of notches, and the bottle must be inverted below a horizontal position to open the valve. The device is also provided with a vent tube, having independent valve mechanism, and adapted to permit the contents of the bottle to flow freely, when the bottle is inverted.

Robert M. Van Buskirk, Tipton, Ind. Catch Basin Top.—The catch basin of this patent provides an ingenious arrangement for collecting the trash to prevent the same from either accumulating in the gutter, or passing into the catch basin. The device, which greatly facilitates the removal of trash and other accumulation, comprises a top provided with an opening, a trash box depending from the top and having an entrance opening to permit water and trash to flow freely into it, and a straining device arranged at the back of the trash box. The straining device consists of a series of rods depending from a lid, which covers an opening in the top.

James W. Strait, Bowling Green, Ky. Gate.—This patent discloses a swinging gate, capable of being readily hung at either side of a gateway and of swinging in either direction. The gate comprises horizontal rails or bars, vertical bars located at opposite sides of the gate, inclined braces arranged in pairs and extending from the upper and lower ends of the rear vertical bars to about the center of intermediate vertical bars, and abutting against the latter and also against each other, and hinge members provided with arms, embracing the rear bars of the gate and overlapping and connected to the rear ends of the braces.

Simon S. Lanyon, Mineral Point, Wisc. Steam Boiler.—The present invention is designed to obviate the disadvantages resulting from the use of a steam dome on traction engines, and means are provided for conveying steam directly from the boiler to the steam supply pipe without the use of a steam dome. The movable horizontal steam boiler is provided with a steam supply pipe, located above the boiler and having branch pipes extending longitudinally of the boiler in opposite directions from the supply pipe. The branches have down-turned inlet terminal portions, connected directly to the boiler in close proximity to the same. These branch pipes constitute the sole means of communication between the interior of the ends of the boiler and the steam supply pipe, and they enable dry steam to be obtained at all times from the boiler, when the same is either in a horizontal or inclined position.





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**FOR SALE**—Patent No. 831,583. Combination Tool for use by house painters. Provides a putty knife, pot hook, nail puller and hammer, in a single piece. Fills a long-felt want. Address, Ira E. Vanauken, Twin Falls, Idaho. jan

**FOR SALE** or on royalty—U. S. Patent No. 828,725. Frogs for Switches, for large or small roads; novel and cheap to manufacture. Greatest invention of the day. Men with ready cash can make a fortune; make me an offer. Address, W. J. Eicher, Smithton, Pa. jan

**FOR SALE** outright or on royalty.—Valuable patent; Cultivator Attachment, rotary hoe for thinning or weeding in the road, automatic or controlled by hand; especially adapted to fruit culture. No agents. Address, James A. Staples, Box 65, Marlborough, Ulster Co., N. Y. jan

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**FOR SALE**—Patent No. 831,201, dated September 18, 1906. Pie Cutter and Crimper for sale to the highest bidder. A very simple article. Address, W. A. Beamer, Mt. Vernon, Ohio. jan

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**FOR SALE**—Patent No. 829,266, dated August 21, 1906. Column Clamp. Works the quickest, and is the cheapest to manufacture of anything in its line. Address, J. L. Goss, New Castle, Ind. jan

**FOR SALE**—Patent No. 805,032, dated Nov. 21, 1905. Swinging Gate, adapted when closed to be firmly locked in such position as to prevent hogs and cattle from opening it. Inexpensive to construct. Strong and durable. Address, Claude Siebring, George, Iowa. dec

**FOR SALE**—Patent No. 762,747. Combined Box and Barrel Cart. Two carts in one. Large profit and unlimited demand. Will sell cheap; a snap for right party. Address, L. C. Notbohm, Rome, Wis. jan

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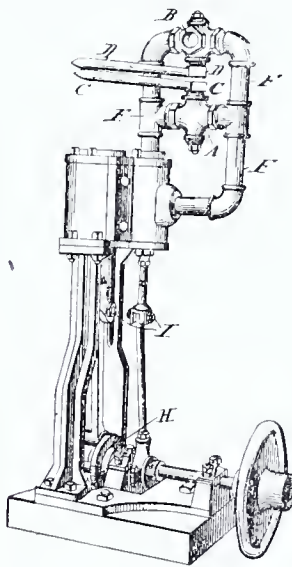
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WASHINGTON, D. C. DECEMBER, 1906.

## Report of the Commissioner of Patents.

The work of the Patent Office during the fiscal year ended last June, according to the report of the Commissioner of Patents which has just been published, showed the same tremendous increase that has characterized it annually for the last six years, the advance in receipts, expenditures, number of patents issued, etc., averaging more than fifty-four per cent. The receipts have risen to over \$1,800,000, and the expenses to a million and a half. In only one line of the elements of work has there been disproportionate progress, and that is in the number of employes. Although an increase of force was granted to the Office at the last session of Congress—twenty-nine additional examiners and twenty-one clerks—it has proved inadequate to cope with the huge amount of new work that is being constantly brought before the Office. As usual, a large number of applications for patent (21,000) still await action. In view of the fact that the Patent Office is one of the few bureaus of the Government that pays its own way, and in fact turns over each year a substantial balance into the Treasury—\$273,000 during the period under review—it would seem that Congress could afford to supply it with enough employes to do its work properly. The Commissioner urges that a regular annual increase should be made in the force of examiners and clerks, as under the conditions of prosperity our country is now enjoying, experience has shown that there is an increase in our necessities, and a corresponding growth in the work of the Patent Office. He also calls attention to the fact that the Office is much overcrowded, and that there has been no substantial relief given in the matter of increased space. More room would mean economies in transaction of business, and the surplus gained by the Office should be expended in providing it with adequate facilities for the performance of its work. Details from the report are quoted below:

### APPLICATIONS & FINANCES.

"There were received in the last

fiscal year 55,619 applications for mechanical patents, 821 applications for designs, 172 applications for reissues, 1938 caveats, 10,888 applications for trademarks, 943 applications for labels, and 438 applications for prints. There were 31,837 patents granted, including reissues and designs, and 10,408 trademarks, 741 labels and 354 prints were registered.

"The number of patents that expired was 20,682. The number of allowed applications which were by operation of law forfeited for nonpayment of the final fees was 5,193. The total receipts of the Office were \$1,811,297.84, the total expenditures were \$1,538,149.40, and the surplus of receipts over expenditures, being the amount turned into the Treasury, was \$273,148.44.

### NEW TRADEMARK LAW.

"The fiscal year ended June 30, 1906, exhibits the first year of work under the new trademark law of February 20, 1905. This law took effect April 1, 1905, and during the last three months of that fiscal year, although 9,710 applications for registration of trademarks were made under this law, the delays necessarily caused by the requirement of publication of trademarks prior to their registration, prevented the registration of any of these applications under the new law until the beginning of the present fiscal year. To the applications first mentioned, there were added 10,888 applications during the fiscal year under consideration, making a total of 20,598 applications for registration of trademarks for consideration and registration during the current fiscal year. This enormous increase in the burden of work in the trademark division has added very much to the labor of this Office. Out of these there have been registered 10,408 trademarks to the close of the fiscal year, and by the tables above shown it appears that for the years 1903 and 1904 the number of trademarks registered was only about 2,200 in each of these years.

It is thus seen that the trademark registrations of this Office have increased nearly 500 per cent. due to the cheapness and liberality of the new law.

### INCREASE OF WORK.

"The table of receipts, expenditures, etc., embodying the chief work elements of this Office, emphasizes the tremendous increase in all these elements during the last six years, the increase in seven of these elements averaging more than 54 per cent.

"Although the number of applications awaiting action on the part of the Office July 1, 1906, appears large, it is only fair to the working force of this Office to remember that during the period of the increases above noted in the work elements, the increase in the number of employes has only been 11.9 per cent up to the close of the fiscal year in question. An increase of force was given to the Office at the last session of Congress, comprising 28 examiners of all grades and 21 persons in the clerical force. This additional force became available on the 1st of July, and it is confidently expected that a gratifying improvement in the condition of the work of

the Office will be brought about by their aid. In fact, already improvement in the conditions of the work can be noted.

### THE PATENT OFFICE GAZETTE.

"During the latter half of the fiscal year, a careful investigation was made to see if a change in the method of producing the *Official Gazette* of this Office might not make an improvement in this publication and result in a saving of expense. The legislative, executive, and judicial appropriation bill of June 22, 1906, reduced the amount available for the production of the *Official Gazette* by about \$70,000, and in the latter part of the year preparations were made for the substitutions of zinc etchings for the antiquated and expensive dummy-card process which had been used for this publication for many years. The estimates presented involved the doing of all of this work at the Government Printing Office instead of contracting for the photolithographic production of the illustrations for this publication. The change has proved satisfactory, as well as economical.

### STORING MODELS.

"The storage of models of inventions was considered by the committees of Congress, and the appropriation for rental of portions of the Union Building on G street, devoted to this purpose, was cut from \$19,500 to \$10,000. This suggested the necessity of reduction in the number of these models; but the urgency of this question has been removed by the acceptance of a reduced rental for the space occupied by the Patent Office, so that the question of the advisability of scattering this collection of models is for the time postponed.

### COPIES OF PATENTS.

"Substantial progress has been made in the reproduction of exhausted copies of patents, and practically all printed copies of patents are reprinted without delay upon request."

### Liquid Air.

One of the most fascinating chapters in the romance of science is that relating to the manufacture for industrial purposes of quantities of oxygen and nitrogen, extracted in a liquid state from atmospheric air. Liquid air is not a novelty as a source of power, but a new method has been devised by which it can be supplied at a price that will bring it within the reach of any industry. One-sixth the present market rate is promised, with an ultimate cost of a fraction over two cents a gallon. The result is obtained by means entirely mechanical, and without the use of any chemical factors. The air is first purified and then gradually compressed to 2,500 pounds to the square inch. In another stage it is reduced to 125 pounds to the square inch, which then is allowed to cool, and thus to liquify the high-pressure air. The oxygen gas produced by separating the nitrogen from the liquid air, is said to be purer than that provided by the method formerly used, and can be supplied either in the liquid or in the gaseous form. One gallon of liquid air equals approximately 128 cubic feet of oxygen gas,

which sells at retail at six cents per cubic foot. Kept in vacuum containers, the liquid air will not evaporate for seventeen days.

By the aid of this agent, much costly and tedious riveting may be dispensed with. Iron can be welded against iron, copper against copper, etc., in a few minutes. Liquid air has also been tried in mines as an explosive. For this purpose, marl is wet with petroleum and then saturated with liquid air. The resulting paste constitutes a good explosive when fired with fulminate, and has the advantage, when it hangs fire, to be without danger, in case of fire damp and other explosive gases, as the air evaporates very rapidly. In expanding, it will exert a pressure of 15,000 pounds to the square inch—enough to make it a substitute for dynamite.

That oxygen and nitrogen can be separated from liquid air and sold retail at \$1.20 per gallon shows great commercial possibilities. The use of nitrogen for agricultural purposes opens yet another field. The maturing of liquors will be helped by liquid air, as well as the preservation and purification of milk. In medicine, also, it will be found useful. Physicians foresee the possible treatment with this agent of certain affections of microbial origin, such as anthrax, lupus, etc. It is already used in London in place of ice for cooling drinks, and has the advantage that it does not perceptibly dilute the beverage with water.

As a motive power, it will be found particularly applicable to submarine boats, as well as to balloons, and may solve the problem of a source of cheap power for automobiles, which would make this form of transport as popular as the bicycle was a decade ago. The British government is already carrying out experiments with a view to utilizing liquid air for various purposes.

### Submarine Signaling Apparatus.

The use of a new submarine signaling apparatus, consisting of a bell under water, the note of which when rung may be heard a long distance away, is rapidly growing in favor among vessel owners and masters, and many new ships of the government are having it installed as a part of their equipment. The use of the submarine signal enables a vessel to give warning of its presence in thick and foggy weather to vessels many miles off, and is said to be a great preventive of collisions at sea. It is stated that nineteen lightships on the eastern coast of the United States have been equipped with the apparatus, and its work has been found most satisfactory. The apparatus has been placed aboard the battleship Connecticut and on a number of the torpedo boats, in order to give it a thorough test before its adoption by the navy.

### Catching Fish with Mirrors.

The invention of a mouse trap with a looking glass to lure the mouse has been followed by a fishing line with a similar device. The mirror is so arranged that when the fish approaches the bait he will see himself, and thinking another is about to get the prize, will make a dash for it. It yet remains to be seen how it will work in practice.



## SCIENTIFIC

## PROGRESS.

**Protecting Fruit From Frost.**

The smoke from tar or smudges is being used by owners of orchards and vineyards to protect the fruit against damage from late frosts. It is said that the smoke, enveloping the buds, acts as a protecting mantle. Various materials can be used—old straw or hay, leaves, tar, etc; success depends only on the generation of enough smoke to cover the vines or trees to be protected.

**Automobiles in the Soudan.**

The ship of the desert is about to yield place to the automobile, thus instancing another triumph of modern methods of locomotion. The government of Egypt will use motor cars for the police inspection service in the desert between Edfur and the Red Sea, as experiments have shown that the tour of inspection can be made in two weeks, instead of taking six, as when camels were employed. Although some difficulty is encountered on account of the drifting sands, the desert roads as a rule are said to be very good.

**Pure Milk.**

The importance of pure milk for the children, especially in the crowded centres of population, has been too often emphasized to need reiteration. A simple method of pasteurizing the fluid is given below. Place the milk in glass jars, fill a pail with boiling water and put the jars in this, so that the water will come above the milk. Keep warm, and stir the milk occasionally. The milk is heated to the desired degree before the water is lowered to the pasteurizing temperature. Lastly and most important, cool the milk by running cold water into the pail, then stopper quickly and place on ice.

**Saving Refuse Ores.**

A new process of treating refuse ores has been put into practice in Australia, by means of which enormous savings may be effected. Millions of tons of tailings of the lead-zinc-silver ores of that country have accumulated in the dumps, and have been considered practically worthless. A plant has been erected for treating these dumps, and has been so successful that another, capable of handling 2,000 tons of material a day, is about to be opened. When in full operation, the output of zinc, it is estimated, will reach the total of 292,000 tons, which is equal to half the world's production, and must have an important influence on the market price of this metal.

**Sucking Bottle for Trees.**

As the circulatory system of trees is becoming better known, new methods of treating them have been adopted. Trees that do not flourish are sometimes fed with a bottle. They appear, it is said, to suck in the sustenance at a rapid rate. It has, indeed, been found possible to regulate to some extent the growth of young trees by such

means, retarding their development or making it more rapid as may be desired. Experiments have shown that chemical substances injected into some trees can be detected in the sap of the topmost twigs within a few hours.

**Use for Fire-killed Timber.**

According to the forest service, thousands of acres of timber that were killed by forest fires, can be turned to good advantage. In mining and railroad works it is largely employed, and mills have been established to saw up the logs into boards and boxes. The seasoning is said to be better than that of ordinary timber. Fire-killed pine loses its odor and is used for making cracker boxes.

**The Making of a Steel Rail.**

Among the wonders of the engineering world stands the steel mill at Homestead—the place made famous by the strike of some years ago. The story of a steel rail—to take only one of the products of the mill—reads like a bit of fiction. The ore yards contain a vast pile of ore—perhaps half a million tons. Near by are the bins for coke and limestone. Properly mixed, these three materials go in a continuous stream of cars to a row of eleven big furnaces. These are insatiable monsters, devouring ten tons every minute.

Every little while the furnaces are "tapped," and the molten iron flows into a train of small cars, which hurries off to the great mixer. This is a steel box on rockers. The cars are emptied into the mixer, which rocks up and down until the iron is all of one quality. Then a second train puffs up, receives a load of iron (about 200 tons) from the mixer, and hastens away to four Bessemer converters, which blow iron into steel at the rate of four tons a minute.

The converters spout their steel into big ladles, which pour the spluttering fluid into molds, pushed into position on a third train. When the molds are filled, the train runs about fifty yards away and stops. As soon as the steel is cooled into red-hot ingots, they are taken out and put into gas ovens so that they will not become cold. From here, one at a time, they are jerked out and dropped upon a small electric car, which rushes them to the rollers to be squeezed into shape.

Back and forward they are passed through the rolls, which operate much like the wringer of a laundry. Every time an ingot goes between them it comes out longer and thinner. Soon it looks like a red worm, squirming to escape. Now it begins to resemble a rail. In a second it is switched to another track, where two whirling saws cut off its ends. Steel hands grip it again and fling it through a cold rolling machine, so that its surface may be hardened. Straightened, and with holes drilled in the ends, it is ready for use.

No human hand has touched it from beginning to end. The only hand labor is the drilling of the holes. As the eye follows it in its course, it perceives very few workmen. The whole is a triumph of machinery.

**New Linen Plant.**

The linen industry of the world, it is predicted, will be revolutionized by the recent discovery and development of a new fiber plant, which grows in South America and particularly on the great plains of Brazil. The new plant is known as Brazilian linen, and experiments on a number of plantations, in which English capital is invested, demonstrate that the fiber is a success and that its influence will at once be felt in the fabric world.

The Brazilian linen plant is practically a weed, which grows from 12 to 18 feet in height in four months, and in general resembles hemp. It is hardy, resisting rain and drouth, and not being a prey to insects. It requires no special care after planting, and matures so rapidly that a crop can be gathered within three months after sowing. The fiber has all the qualities required for weaving—strength, fineness, flexibility and adaptability for dyeing. The strands are much longer than those of European hemp, and can furnish either fine linen or strong rope. Dyed samples have a lustrous and silky appearance. The residue of the plant is high-grade cellulose, said to be especially suitable for the manufacture of fine writing paper, the whiteness and clearness of the stem of the plant simplifying the process of manufacture. In many respects it has advantages over the European product, while the rapidity of its growth and the abundance of its output promise to yield marvelous returns on the money invested. Up-to-date machinery has been sent from Europe for the extraction of the fiber. Whether the plant can be grown to advantage in the southern portion and Pacific coast region of the United States, free from frost, is not yet known. An investigation is to be made, however, and if conditions are favorable, a new agricultural industry may be established in our country.

This enterprise, if successful, would be of special interest to Americans, for the reason that although we grow flax and manufacture linen in important quantities, the product does not, as yet, equal that of German and Irish looms. This is mainly to be attributed to the quality of the water in which the flax is retted. Retting is the work of disintegration, so that the fiber or purely textile matter of flax may be more readily separated from its envelope of straw, and afterwards stripped by hand. This is the first step in the manufacture of linen.

Linen retting, it may not be generally known, is based on the principle of fermentation, which may be brought about by different means, viz., steam, soaking in water, or treatment with chemicals. It is really the work of a microbe, which is engendered in the stalk of the textile through the action of humidity or heat. In this country, the retting is usually accomplished through the agency of steam, while in Europe, the method of soaking is employed.

It is a strange fact that all water does not perform the same work. Flax retted in stagnant water, for instance, has a deep yellow or gray appearance; that retted in running water is much

lighter in color and better in quality. It is the custom to pack bundles of flax in large boxes, about four feet high, which, after being covered with a thick layer of straw are sunk into the river and held in place by stones. They remain in the water for from 3 to 15 days, according to the weather, the best results being obtained in mid-summer. The microbe develops rapidly under the action of heat, and during storms when the air is charged with electricity, the work is sometimes accomplished in a single night. Then the flax must be immediately removed and dried. Expert knowledge is necessary to enable the operator to calculate the exact moment when the flax should be taken from the river. This moment is when the pectose, a resinous, gummy, clinging substance which makes the fiber adhere to the woody stalk of the plant, is sufficiently dissolved or absorbed by the microbes. Delay after this period would mean serious injury to the flax.

The water of the river, below the spots where linen is retted in large quantities, is black and smells badly. Certain rivers are better adapted than others for retting, the question being determined by the swiftness of the current, the composition of the water, and even, it is said, the nature of the soil through which it flows. Experiments are being made in different streams in New York State, with a view to establishing an industry which shall produce linen equal to that which has now to be imported from across the Atlantic.

**Power from Waste.**

How to dispose of the refuse of cities, otherwise than by sewerage, is a question of live interest. The common custom is to dump it into disused pits or to spread it on available land, but this causes annoyance to adjacent residents and is unsatisfactory from a sanitary point of view. A new method is to utilize the refuse for the production of steam and electricity, thus creating power from what is worse than waste. By this system, instead of the disposal of refuse being a charge upon the municipality, it may be made a source of income.

**Identification Postcards.**

The Postoffice Department in Germany has introduced a card of identification which will be most useful to travelers. Upon the card is printed its number, date of expiration, the name and residence of the owner, the date of issue, and the seal of the postoffice issuing it. Within a fold is pasted a small photograph of the owner, opposite to which is a description of his general appearance. His signature is also given. The card is used in obtaining mail where the owner is not known, and will also be found valuable for identification in other instances.

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Issued October 30, 1906.

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Truss..... F. Crater  
Tuning hammer..... A. L. Hale  
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Tunnel shield..... E. W. Moir  
Turbine..... W. T. Carter  
Turbine. Hydraulic..... A. Bonom  
Turbine. Multistage..... O. Junggren  
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Tweezers and blackhead remover. Combined..... H. H. Severia  
Type distributing machine..... F. McClintock  
Type making machine..... R. C. Vetter  
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Typewriters. Folding copy holder for..... C. C. Chrisman  
Umbrella frame..... M. B. Zuber  
Valve..... H. C. Montgomery  
Valve..... J. J. Wilber  
Valve. Air brake bleeding..... H. A. Miner  
Valve gear..... W. A. Webster  
Vehicle brake..... J. H. Farman  
Vehicle Motor..... M. Fischer  
Ventilator..... L. Walente  
Veterinary operating table..... C. Cozier  
Vitreous and other cast or molded fixture..... W. G. Coxon  
Voltage regulator..... R. P. Jackson  
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Vulcanizing apparatus..... J. R. Austin  
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Wagon. Dumping..... J. W. Sheets  
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Washing machine..... C. A. Dodge  
Washing machine. Steam..... H. John  
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Water tube boiler..... F. D. Potter  
Weaver. Calif..... C. J. Lord et al  
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Weighing device. Automatic grain..... E. O. Berg  
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Well tubing clamp..... B. G. Riggs  
Wells. Drilling..... H. R. Decker  
Whiffletree..... W. E. Phillips  
Wind shield..... A. L. Banker  
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Wire coupling..... A. Oskamp  
Wire stretcher..... J. B. Adams, Jr  
Wire stretcher..... T. A. Haldeman  
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Wrench..... J. Anderson  
Wrench..... J. MacLean  
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Wrench..... J. Lovell  
Wrench..... J. Hartigan  
Wrench..... H. F. Hoffmann  
Yoke. Neck..... S. C. McClanahan

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Badge..... F. S. Frisbie  
Badge pin..... E. F. Mackall  
Casket name and handle plate..... E. Cleff  
Game board..... L. Hudgin  
Shirt waist box..... O. Balogh  
Spoon or fork or similar article..... H. G. Petty  
Stove. Gas..... C. Schaefer

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Air compressor. Automatic..... J. Rogers  
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Amusement device..... O. Hennrichsen  
Anchor..... F. B. Langston  
Apparel. Wearing..... W. J. Clayton  
Auger bit..... A. N. Webb  
Automatic lighting burner..... H. Lyoon  
Automatic lock..... F. K. Heupel  
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Ball player's pad. Base..... E. Flick  
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Bearing. Step..... H. J. Flood  
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Bootjack..... H. Weber  
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Brick clamp..... P. Stewart  
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Car brake..... T. F. H. Zealand  
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Car safety fender. Street..... G. D. Potter  
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Car vestibule. Railway..... W. F. Richards  
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Coffee grading mechanism. Ground F. Conner  
Collar supporter..... F. B. Reynolds  
Colter attachment for plows. Adjustable..... S. Dodge  
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Corn popper..... C. C. Font  
Corset side steel..... J. E. Doolittle  
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Couches. Automatic locking and releasing device for..... F. J. Crouch  
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Crate or box. Folding..... J. H. Parsons  
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Cultivator..... L. Roy  
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Decapping, recapping and sizing machine..... D. E. Swaysgood  
Decorating ramie and other fibrous plants. Machine for..... J. M. A. Faure  
Demand indicator..... L. Wilson  
Dental handpiece..... W. W. Freeman  
Desk and seat..... E. H. Claudy  
Dish washing machine..... C. W. Donnell  
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Doll head..... J. W. Horne  
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Electric machine. Dynamo..... R. & F. Pohl  
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Retort furnace.....P. Brown  
Rheostat.....O. T. Weiser  
Rifling.....H. Vulpius  
Rock drill.....C. J. Smith  
Rod coupling.....J. M. Lynn  
Roof for buildings. Metal.....F. A. Richter  
Rope clamp.....E. D. & E. A. E. Mousseau  
Rotary engine. Reversible.....R. N. Story  
Rotary explosive engine.....B. F. Walker  
Rotary explosive engine. Multiple cylinder.....B. P. Walker  
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Selective system.....W. R. Whitehouse  
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Shock absorber.....C. Morgan  
Shoe ironing jack.....H. D. Coffman  
Shoe polishing machine.....R. O. Hammond  
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Spindles. Bobbin clutching means for rota-  
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 Nail coating machine..... C. Wagoner  
 Necktie fastener..... T. Seiler



Necktie holder ... R. T. Leclerc  
 Nozzle. Spraying ... C. A. Koepnick  
 Numbering machine ... P. R. Dill  
 Nut lock ... F. H. Fellows  
 Oil press ... F. Oliver  
 Oiler ... H. B. Anderson et al  
 Operator's key ... A. Carliss  
 O.e. concentrator ... W. Lerchen  
 Ore roasting furnace. Mechanically rabbled ... T. Edwards  
 Overseaming machine ... L. Onderdonk et al  
 Packaging machine ... I. Lazakia et al  
 Pad or bustle ... F. M. Whitney  
 Panel construction ... P. M. Wege  
 Paper hanger. Wall ... C. O. Shirk  
 Paper tray ... F. B. Davidson  
 Pedal mat ... G. Winters  
 Pedal. Self-locking ... G. F. Discher  
 Pen cap and barrel. Fountain ... J. N. Whitehouse  
 Pen. Self-filling fountain ... J. N. Whitehouse  
 Pen-stamping machine ... J. Gabrielson  
 Penholder ... M. L. Little  
 Pencil sharpener ... D. D. Rush  
 Petroleum Apparatus for the rectification of ... E. A. Barbet  
 Phonograph ... C. W. Noyes  
 Phonograph records. Duplicating ... V. M. Harris  
 Photographic printing frames. Shutter ... J. Kaut  
 Photographic vignetter ... G. F. Fraley  
 Piano case lid support ... C. Kohler  
 Piano. Violin ... J. L. Warner  
 Pick point. Removable ... C. Bonique  
 Picking cradle ... W. H. Richards  
 Pie machine ... O. Colbourne et al  
 Ring. Interlocking metal sheet ... G. E. Nye  
 Piling. Metal sheet ... 2 pats. J. R. Williams  
 Piling. Metallic sheet ... R. V. Sage  
 Pipe joint. Balanced compensating ... G. A. Oliver  
 Pipe wrench ... D. D. Barnum  
 Planing machine. Metal ... C. O. Harley  
 Planter. Corn ... J. O. Brown Sr  
 Planter coverer ... G. Stapp et al  
 Plate or negative squaring machine ... J. L. Perkins  
 Pliers. Jeweler's ... E. C. Chamberlin  
 Plow ... F. A. Bressmer  
 Plow. Disk ... J. Moore  
 Plow shovel ... J. J. McManmon  
 Plow. Steam gang ... A. G. Kern  
 Plug. Attachment ... D. E. Bown  
 Plumbers, &c. Testing device for ... N. B. Feather  
 Pneumatic cushion for vehicles ... A. M. Lockett  
 Pneumatic wheel ... G. H. Treadgold  
 Pocket book protector ... C. T. Marshall  
 Pole holes. Means for closing sliding ... J. Stevenson  
 Powder. Producing explosive ... F. I. du Pont et al  
 Power transmission connection ... R. J. Hoffman  
 Press ... F. Oliver  
 Pressing machine ... W. Pool  
 Printing cylinders. Forming ... J. W. McIndoe  
 Printing machine ... W. Scott  
 Printing machine. Web ... L. C. Crowell  
 Printing press ... S. G. Goss  
 Printing press. Multiroll web perfecting ... S. G. Goss  
 Printing slug. Line ... J. R. Rogers  
 Pulley. Expandable ... G. S. Cox  
 Pulleys. Adjusting mechanism for expandable ... H. J. Reed et al  
 Pump. Massage ... C. P. Engeln  
 Pump piston ... T. H. Gallagher  
 Pumping system ... W. M. Myers  
 Punching machine ... F. G. Oidenburg  
 Rail brace. Adjustable ... F. C. Anderson  
 Rail brake ... W. C. Schulz  
 Rail. Guard ... T. Carmichael  
 Rail joint ... B. Wolhaupter  
 Rail joint ... I. Johnson  
 Rail joint ... C. E. Schreffler  
 Rail joint ... H. D. Shuster  
 Rail joint ... L. S. Gordon  
 Rail splice ... J. K. Bergstrom  
 Rail structure. Guard ... E. S. Hippey  
 Rails. Means for preventing creeping of ... C. H. Caspar  
 Railway safety apparatus ... G. T. & L. Woods  
 Railway signal ... J. C. Naglney  
 Railway signaling system ... L. H. Shullen  
 Railway signaling system ... J. G. Horazdovsky  
 Railway trains. Hose coupling for ... A. F. Morton  
 Range base ... J. J. Geis  
 Reed, wire, willow, or similar plotting or lattice work ... P. Loscher  
 Reflector ... W. A. McCoy et al  
 Refrigerator attachment for milk cans ... S. L. Croy et al  
 Return ball ... C. M. Thomas  
 Revolving case ... O. Shidler  
 Rifle apparatus ... J. M. Conper  
 Rifle sight ... H. L. Bock  
 Rock drill ... W. C. Whitcomb  
 Rock drill ... J. J. Rekar  
 Rolling mill. Sheet metal ... E. Norton  
 Rolling mill work reversing mechanism ... V. Chartener  
 Roof flange ... J. C. Lanth  
 Rope clamp ... M. Spearbeck  
 Rotary engine ... E. G. Kesling  
 Rotary engine ... W. H. Downing  
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 Sawmill dog ... G. S. Sergeant  
 Scaffold. Portable ... B. A. Soall et al  
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 Seed tester ... M. Rahr et al  
 Seining apparatus ... A. Yancey  
 Separator ... G. W. Christoph  
 Sewing machine ... E. C. Ives  
 Sewing machine take up mechanism ... R. G. Woodward  
 Sewing machines. Needle and pull off shifting mechanism for ... R. G. Woodward  
 Shade roller attachment ... W. B. Reynolds et al  
 Shift attachment. Vehicle ... O. G. Cranston

Ship's progress indicator ... T. Whittle et al  
 Shot making machine. reissue ... P. F. Gowing  
 Sign ... 2 pats. W. J. Bailey  
 Sign. Illuminated ... W. T. Bradshaw et al  
 Signal system. Air brake ... T. J. Quirk  
 Silk and artificial hair from casein. Production of artificial ... F. Todtenhaupt  
 Silversmith's stock ... M. T. Goldsmith  
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 Splice bar ... R. V. Sage et al  
 Spoke tenon and felly clip ... J. Wilcox  
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 Spring wheel ... J. H. Kennebrew  
 Stanchion. Cattle ... J. R. Dunn  
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 Sterilizer ... H. A. Miller  
 Stitch indenting machine ... F. Chateaufort  
 Stop motion mechanism ... H. Sirols  
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 Strainer. Milk ... R. A. Kreiner  
 Sweaters. Neck and front piece for ... H. Starr  
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 Switches. Interlock for electric ... O. O. Rider  
 Syringe. Vaginal ... G. C. Loar  
 Table ... S. Hall  
 Telegraph station. Temporary ... C. S. Maynard  
 Telephone apparatus ... D. H. Wilson  
 Telephone apparatus ... H. J. Roberts  
 Telephone or switchboard plug ... A. B. Dozier  
 Telephone toll apparatus ... E. P. Baird  
 Telescope ... E. Lohmann  
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 Type writing machine ... A. F. Kunaath  
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 Type writing machine ... G. A. Seib  
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 Vehicle. Traction ... F. H. Gilbert  
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 Wagon. Dumping ... W. E. Currie  
 Wagon. Damping ... D. J. Waterous  
 Wagon jack ... J. Locke  
 Wagon unloading attachment ... H. L. Wishon  
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 Wall tie ... P. J. Shrum  
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 Wood cleaning and polishing device ... J. W. & H. F. Plummer

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 Wrench ... M. Wenger

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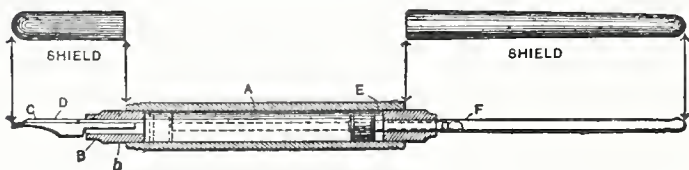
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